# ABSTRACTS of RECENT PUBLISHED MATERIAL on Soil and Water Conservation



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# ABSTRACTS OF RECENT PUBLISHED MATERIAL ON SOIL AND WATER CONSERVATION

Prepared by J. H. Stallings
Research Specialist
Bureau of Plant Industry, Soils,
and Agricultural Engineering

This is the EIGHTH of the publications issued at irregular intervals under this title. Prior to this issue Soil Conservation Service has been the issuing agency, and most of the material for this issue was compiled before the transfer of most SCS research projects and research personnel to BPISAE.

Distribution of this publication is confined to technical personnel of the Soil Conservation Service, the Bureau of Plant Industry, Soils, and Agricultural Engineering, and cooperating agencies and to other scientists and conservation workers who specifically request it.

Authors of articles and reports in the field of soil and water conservation are urged to supply abstracts, reprints, or copies to J. H. Stallings, Bureau of Plant Industry, Soils, and Agricultural Engineering, U. S. Department of Agriculture, Beltsville, Maryland.

SUBJECT-MATTER INDEX

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LIME AND MOLYBDENUM IN CLOVER DEVELOPMENT ON ACID SOILS.

By A. J. Anderson and D. V. Moye; Australian Jour. of Agr. Research, Vol. 3, No. 2, pp. 95-110. April 1952.

In a study of the factors concerned in the effect of lime on subterranean clover on an acid soil where nodulation is defective, it has been found that responses equal to those obtained with heavy application of lime can be obtained by the applications of molybdenum together with only 200 pounds of lime per acre at seeding.

Marked response to molybdenum was obtained only where low levels of lime were used. Where heavier applications of lime were applied the clover grew normally and did not then require treatment with molybdenum. Where no lime was used nodulation was defective and, during the first two years, response to molybdenum did not occur or was very small. Nodulation subsequently improved on the unlimed soil and response to molybdenum progressively increased over the five-year period of the experiments.

In the year of sowing best results were obtained where the inoculated seed was drilled with the lime. The evidence suggests that defective nodulation of subterranean clover may be expected on new land where the s oil reactions are less than pH 5.0, and that soils of higher pH but with minimum values less than pH 5.5 are also suspect.

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PLANT RESPONSES TO NITROGEN AND SULPHUR ON A HEAVY CLAY SOIL FROM THE DARLING DOWNS, SOUTH-EAST QUEENSLAND.

By C. S. Andrew, E. H. Kipps, and Helen Barford; Australian Jour. of Agr. Research, Vol. 3, No. 2, pp. 111-124. April 1952.

Pot experiments in connection with investigations into poor establishment of certain pasture species on several heavy clay soils on the Darling Downs have shown nitrogen and sulphur to be the principal elements limiting plant growth. Addition of these nutrients in combination to the soil has resulted in a substantial increase in plant growth associated with an even greater increase in protein production. These increases greatly exceed those obtained with either nutrient singly. Zinc availability in the soil is also discussed.

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THE OCCURRENCE OF SULPHUR DEFICIENCY ON A SOIL OF ADEQUATE PHOSPHORUS STATUS.

By K. D. McLachlan; Australian Jour. of Agr. Research, Vol. 3, No. 2, pp. 126-127, April 1952.

Subterranean clover grown on a basaltic soil from Cooma, N.S.W., responded markedly to treatment with sulphur, as sulphate. The sulphur deficiency occurring on this soil was uncomplicated by deficiencies of other elements, including phosphorus. Even when the sulphur deficiency had been corrected the phosphorus status of the soil was adequate for normal clover growth.

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MULCHING CORN CUTS EROSION LOSS.

By H. L. Borst; The Ohio Farmer, p. 9. June 21, 1952.

Erosion starts when rain strikes the soil. Water not entering the soil becomes run-off and carries soil particles along with it. Rains which fall with the most force in Ohio usually occur before corn plants are tall enough to cover the ground and break the force of the raindrops. Hence the rills, channels and gullies in many Ohio cornfields on sloping ground. A mulch of manure breaks the force of raindrops.

Over a period of three years separate plots of corn were treated with from 8 to 10 tons of manure per acre. It was plowed down on part of the plots and these were compared with similar plots in which the manure was applied as a mulch. Figures for the three years show that runoff was reduced nearly a half by the manure mulch. Erosion fell to around a half-ton per acre which is a good record. The loss of soil from the unmulched plots was 30 times this amount. Apparently the manure mulch broke the force of the raindrops.

This practice cuts down erosion without reducing the yields. Another six-year experiment showed that yield was about the same for plowed down manure and manure applied after the second cultivation. In the dry season of 1951 the yield was higher from the mulched plots.

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EFFECT OF MINOR ELEMENTS, PARTICULARLY COPPER, ON PEANUTS.

By Henry C. Harris; Fla. Agr. Exp. Sta. Bul. 494. May 1952.

Four field experiments with peanuts were conducted on Arredondo loamy fine sand. Secondary and minor element treatments were applied and in some of the experiments the treatments were applied to previous crops so that the residual effect was measured. The appearance of the plants during growth was observed and yields were obtained at harvest time.

Copper treatments corrected abnormal growth

characteristics of the foliage of plants grown on untreated soils and greatly increased yields. There was a pronounced effect on yields from copper applied three years previously.

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APPLICATION OF FERTILIZERS TO AID CONSERVATION ON ANNUAL FORAGE RANGE.

By O. K. Hoglund, H. W. Miller, and A. L. Hafenrichter; Jour. Range Mgt., Vol. 5, No. 2, pp. 53-61. March 1952.

Fertilizer trials on annual-forage range have been made on Positas gravelly clay loam soil at Sunoil, California since 1944. Five years' results from repeated annual applications of 200 pounds per acre of ammonium phosphate-sulfate (16-20-0) show that this fertilizer increased forage production by an average of 2,882 pounds, which is equivalent to 3.60 animal unit-months per acre; reduced fluctuation in production from year to year; advanced the date of grazing readiness by 6 weeks; doubled the length of green feed period; and had no effect on the production of residue.

The effects from the application of three rates of nitrogen and three rates of $P_2O_5$, applied separately and in combination to a new set of plots each year, and the application of gypsum, lime and barnyard manure are given also.

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ECONOMIC ASPECTS OF RANGE MANAGEMENT.

By H. R. Hockmuth, Jour. Range Mgt., Vol. 5, No. 2, pp. 62-68. March 1952.

This paper discusses certain economic aspects of producing forage for grazing animals.

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SUGAR VERSUS THE INTUITIVE CHOICE OF FOODS BY LIVESTOCK.

By Max J. Plice; Jour. Range Mgt., Vol. 5, No. 2, pp. 69-75. March 1952.

It has long been known that grazing animals do not eat vegetation which has been influenced by their droppings. Chemical study shows that lush, manure-affected plants are significantly lower in sugar content than manure—unaffected plants and this apparently makes them unpalatable to animals When lush, ignored plants were sprayed with sugar solutions they were eaten readily by grazing animals. That it was not the sugar, per se, which produced the increase, or improvement, in palatability of the lush plants was seen when such plants, sweetened by saccharine and sodium cyclohetyl sulfamate, were eaten as readily as those sweetened with blackstrap molasses, particularly when aromatized with vinegar or anise oil.

That grazing animals are not endowed with intuitive ability of choosing foods which are nutritionally best for them was seemingly demonstrated by the fact that several inferior and unpalatable forage materials, including mature broomsedge, were eaten readily when they were well sweetened. Weedy fence rows, ditch banks etc., might be sprayed with blackstrap molasses and animals turned in on them. The best way to cater to the sweet appetites of grazing animals is to fertilize forage crops with sufficient available phosphate. This will produce more forage which has a higher sugar content and is more palatable.

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EFFICIENT USE OF FERTILIZER IN THE SOUTHERN REGION.

By W. E. Colwell; Better Crops with Plant Food, Vol. 36, No. 4, pp. 6-9. April 1952.

This paper points up certain adjustment opportunities as examples of means whereby greater economy in fertilizer usage can be attained.

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THE INORGANIC SIDE OF LIFE.

By Firman E. Bear; Better Crops with Plant Food, Vol. 36, No. 4, pp. 10-14, +45. April 1952.

This paper discusses the importance of mineral plant nutrients to the future well being of mankind.

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USE OF A SOIL TEST SUMMARY IN AGRONOMIC PROGRAMS.

By C. D. Welch; Better Crops with Plant Food; Vol. 36, No. 4, pp. 15-20, +39. April 1952.

This paper points out how soil testing data can be used in determining the general fertility level on a county- or State-wide basis.

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WHY PLANTS DIFFER IN FERTILIZER NEEDS AND MINERAL COMPOSITION.

By Mack Drake, W. G. Colby and Jonas Vengris; Better Crops with Plant Food, Vol. 36, No. 5, pp. 12-16 and 42-45. May 1952.

The mineral composition of plants is largely determined by physical-chemical relations between colloidal systems of both the plant root and the soil. Plant material of legumes, and many other dicotyledonous plants, contains relatively larger amounts of calcium and magnesium than grasses and other monocotyledonous plant material, not because these dicot plants require larger amounts of calcium and magnesium within the plant, but because the nature of the root colloid forces large amounts of calcium and magnesium into these plants. Legume and many other dicots with roots

of high cation exchange capacity must be liberally fertilized with potassium, not because these plants have a higher potassium requirement, but because the nature of their root colloid is such as to require a high concentration of available potassium in the soil to overcome the valence effect, thereby crowding potassium into the root by mass action, and thus supplying the legume with sufficient potassium for normal growth. These fundamental relationships have a profound influence on the selection, fertilization, and cultural management of all crop plants.

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THE SOIL PROFILE AS AN AID TO RANGE MANAGEMENT.

By O. C. Olson; Jour. Range Mgt., Vol 5, No. 3, pp. 124-128. May 1952.

The information obtained from enclosures can be applied more accurately by considering three relatively single characteristics of a soil profile -- color, texture and depth. Even when individual study plots are lacking, useful judgments of site potential can be made if these simple characteristics are understood.

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RANGE CONDITION IN EASTERN WASHINGTON FIFTY YEARS AGO AND NOW.

By G. John Chohlis; Jour. Range Mgt., Vol. 5, No. 3, pp. 129-134. May 1952.

There is good evidence that some important grazing areas in Washington are in better condition today than they were reported to be at theturn of the century. Washington ranges have improved because (1) the range has been brought under control through extension of private ownership and fencing, (2) the homeless horse has become a rare sight on Washington ranges, and (3) the conviction on the part of stockmen that the responsibility for the proper use of land under their control rests in their hands, and that better management pays off.

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BETTER MANAGEMENT ON LONGLEAF PINE FOREST RANGES.

By Robert E. Williams; Jour. Range Mgt., Vol. 5, No. 3, p. 135. May 1952.

Good range management practices implement woodland development and permit more efficient use of improved pastures. Based on range-condition inventories, these practices include proper number and class of stock, right season of use, improved grazing distribution, provision for adequate supplements during periods when the range forage is deficient, and control of undesirable vegetation.

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NITROGEN AND SULFUR IN THE PRECIPITATION AT ITHACA, N. Y.

By E. W. Leland; Agron. Jour., Vol. 44, No. 4, pp. 172-175. April 1952.

Precipitation brought down an average of 5.27 pounds of nitrogen and 48.67 pounds of sulfur per acre annually during the period November 1, 1931 to October 31, 1949. The average annual precipitation for the period was 35.53 inches.

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EFFECT OF FERTILIZATION AND MANAGEMENT OF DIFFERENT TYPES OF BERMUDA AND BAHIA GRASS SOILS ON THE NITROGEN AND ORGANIC MATTER CONTENT OF TIFTON SANDY LOAM.

By Earl H. DeVane, Matthias Stelly, and Glenn W. Burton; Agron. Jour., Vol. 44, No. 4, pp. 176-179. April 1952.

The purpose of this study was to determine any measurable soil nitrogen and organic matter differences under sods of different types of Bermuda grassgrowing alone and in association with crimson clover, and to measure the effect of varying nitrogen rates on Bermuda grass and Bahia grass sod in regard to the same constituents. The soil nitrogen and organic matter tended to be higher under Bermuda and Bahia grass sod than in adjacent cultivated fields.

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DIFFERENTIAL RESPONSES OF BARLEY VARIETIES TO 2,4-DICHLOROPHENOXYACETIC ACID (2,4-D).

By Lyle A Derscheid, L. M. Stabler, and D. E. Kratochvil; Agron. Jour., Vol. 44, No. 4, pp.182-188. April 1952.

The purpose of this study was to determine the differential responses in yield, components of yield, and seed viability of several economically important barley varieties when treated with three2,4-D formulations at four stages of growth.

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LABOR REQUIREMENTS FOR SPRINKLER IRRIGATION OF CORN.

By M. W. Bittinger and R. K. Frevert; Agr. Engin., Vol. 33, No. 5, pp. 271-272. May 1952.

This study was conducted for the purpose of determining the labor requirements for moving pipe of a portable sprinkler irrigation system.

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RELATING BASIC RESOURCES IN IRRIGATION RESEARCH.

By George D. Clyde; Agr. Engin., Vol. 33, No. 5, pp. 277-278. May 1952.

Irrigation is treated as a means to an end. Water, soil and plants are the basic resources. To completely develop and utilize these resources on a permanent and profitable basis requires the joint

efforts of research, educational and action agencies.

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NUMERICAL ANALYSIS OF FLOW THROUGH AQUIFERS TOWARD WELLS.

By James N. Luthin and V. H. Scott; Agr. Engin., Vol. 33, No. 5, pp. 279-282, May 1952.

The methods of numerical analysis are used to obtain steady state solutions of Laplace's equation in cylindrical coordinates. Formulas are developed for problems having complicated geometry, variable permeability and various boundary conditions. The flow of water through aquifers into wells is analyzed for four cases of practical interest. Two of the cases examined are for gravity wells and two are for artesian wells.

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SIMPLIFIED PROCEDURE FOR THE MEASUREMENT AND COMPUTATION OF SOIL PERMEABILITY BELOW THE WATER TABLE.

By H. P. Johnson, R. K. Frevert, and D. D. Evans; Agr. Engin., Vol. 33, No. 5, pp. 283-286, May 1952.

This paper discusses the auger-hole and piezometer methods of determining soil permeability under field conditions. It also presents a simplified method.

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USE OF SOIL POROSITY FOR WATER CONSERVATION.

By Lloyd L. Harrold; Agr. Engin., Vol. 33, No. 5, pp. 287-289. May 1952.

Observations on clean-tilled land indicate that runoff and erosion have resulted from summer storms when there was within the 7-inch topsoil enough pore space to take up the entire amount of the storm rainfall. Studies show that the sealing of the soil surface, which limits the rate of water intake into the soil, can be mostly eliminated by the use of mulches.

Mulch culture for corn and other clean-tilled cropland appears to offer a practical aid in solving the problem of beginning the soil- and water-conservation program at the point where the raindrop falls.

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TERRACES ON GRASSLAND.

By Maurice B. Cox, H. A. Daniel, and H. M.Elwell; Agr. Engin., Vol. 33, No. 5, pp. 294-296. May 1952.

This study shows that terraces caused greater runoff on the type of grassland used than on unterraced land. After the grass cover became established, the percentage of runoff was greater on the terraced plot than on the unterraced one. Grass cover was considerably better on the unterraced plot than it was on the one that had been terraced.

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THE EFFECT OF WIND ON THE UNIFORMITY OF WATER DISTRIBUTION BY SOME ROTARY SPRINKLERS.

By H. C. Korren; Sci. Agr., Vol. 32, No. 4, pp. 226-240. April 1952.

This study was for the purpose of determining the effect of wind on the uniformity of water application by some rotary sprinklers at various pressures and spacings. The results of one year's work are presented.

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EFFECT OF WIND-ROW ORIENTATION ON ERODIBILITY OF LAND IN SORGHUM STUBBLE.

By A. W. Zingg, N. P. Woodruff and C. L.Englehorn, Agron. Jour., Vol. 44, No. 5, pp. 227-230. May 1952.

The results of an experiment designed to evaluate soil erosion by wind with respect to the wind-row orientation of sorghum stubble are presented. The data are limited to one field of 9-inch sorghum stubble. Relationships describing the roughness of the surface in relation to stubble density and row direction are developed. Equations for estimating the amount of soil eroded for varying drag levels of the wind and for varying quantities of sorghum stubble are presented. These equations describe the losses experienced with a wind tunnel operated both parallel and transverse to the row direction.

When the rows of sorghum stubble were transverse to the wind, the relative velocity and the drag of the wind on the soil surface were decreased; consequently, amounts of erosion were decreased. These decreases were in comparison to values obtained when wind was applied parallel to the row direction. Measured differences were interpreted in terms of relative soil losses expected for field conditions.

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THE EFFECT OF IRRIGATION, NITROGEN FERTILIZATION, AND CLIPPING TREATMENTS ON PERSISTENCE OF CLOVER AND ON TOTAL AND SEASONAL DISTRIBUTION OF YIELDS IN KENTUCKY BLUEGRASS SOIL.

By R. R. Robinson, V. G. Sprague and A. G. Lueck; Agron. Jour., Vol. 44, No. 5, pp. 239-244. May 1952.

This paper presents 4 years' data on the effects of irrigation, nitrogen fertilization and clipping treatments on clover populations, total yields, and seasonal distribution of yields in a Kentucky bluegrass-white clover sod. The clover

represented a wide variety of types of Trifolium repens with the Ladino type predominating.

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RESPONSES OF ORCHARD GRASS-LADINO CLOVER TO IRRIGATION AND NITROGEN FERTILIZATION.

By R. R. Robinson and V. C. Sprague; Agron. Jour., Vol. 44, No. 5, pp. 244-247. May 1952.

This paper presents the results of studies of the effects of irrigation, nitrogen fertilization, and clipping treatment on persistence of clover yields and seasonal distribution of yields in an orchard grass-ladino clover soil.

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WHEAT PRODUCTION IN THE SEMIARID PACIFIC NORTHWEST AS INFLUENCED BY METHODS OF HANDLING SWEET CLOVER AS A GREEN MANURE CROP.

By Hugh C. McKay, W. A. Moss, and G. O. Baker; Agron. Jour., Vol. 44, No. 5, pp. 247-251. May 1952.

This was a study of the effect of methods of handling a green manure crop upon wheat production in the semiarid dryland of the Pacific northwest. It included both sweet clover and sweet clover-mountain brome grass as green manure crops and two types of plows were used - the moldboard and the subsurface plow. The sweet clover was plowed at three stages of growth, 12-14 inches 20-22 inches, and 34-36 inches. At the time of plowing half of each plot was cut for hay and the other half of each plot was plowed as a green manure crop.

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EFFECT OF SPACING, IRRIGATION, AND FERTILIZATION ON RUBBER PRODUCTION IN GUAYULE SOWN DIRECTLY IN THE FIELD.

By D. C. Tingey; Agron. Jour., Vol. 44, No. 6, pp. 298-302. June 1952.

Yields of rubber and shrub and the percentage of rubber in the dry shrub in 21 and 33 months after seeding guayule directly in the field are given for various spacing, irrigation, and fertilizer treatments. Number of plants per unit area was the most important factor affecting yields of rubber and shrub, and differential irrigation the most important factor affecting rubber percentage. Shrub receiving light irrigation, while intermediate in shrub yield and rubber percentage, gave in general the highest yield of rubber per acre.

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EFFECTS OF SPACING AND NITROGEN APPLICATIONS ON YIELD OF GRAIN SORGHUMS UNDER IRRIGATION.

By C. E. Nelson; Agron. Jour., Vol. 44, No. 6, pp. 303-305. June 1952.

Early Hegan, Martin, and double dwarf white sooner grain sorghum were grown in a factional experiment with three plant populations and four nitrogen levels as variables. The amount of nitrogen applied was the only variable that affected yield significantly. Yield differences between varieties or spacings were not significant. There was no significant interaction between spacing and varieties, fertility and varieties, or fertility and spacing.

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LEACHING OF POTASSIUM AS INFLUENCED BY SOURCE AND FREQUENCY OF APPLICATION OF NITROGEN.

By R. W. Pearson; Agron. Jour., Vol. 44, No. 6, pp. 305-307. June 1952.

From 2 to more than 50 percent of the potassium applied to Norfolk sandy loam and Hartsells very fine sandy loam over a period of 16 years was found to have been leached into and retained by the 8- to 32-inch soil layer. Application of 96 pounds of $K_2O$ quadrennially resulted in accumulation of more than twice as much potassium in the B horizon as annual additions of 24 pounds. The use of physiologically acid nitrogen sources greatly increased the downward movement of potassium, but the addition of lime in amounts required to neutralize the equivalent acidity reduced the amount of potassium leached by nearly 50 percent.

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SALT TOLERANCE OF BARLEY AND WHEAT IN SOIL PLOTS RECEIVING SEVERAL SALINIZATION REGIMES.

By A. D. Ayers, J. W. Brown, and C. H. Wadleigh; Agron. Jour., Vol. 44, No. 6, pp. 307-310. June 1952.

The salt tolerance of four varieties of barley and two of wheat tested on artificially salinized field plots are discussed in this paper. The intensity of the saline stress was varied for different stages of growth. Wide differences in level of salinity during the last stage of growth, grain development, and maturation appear to have virtually no effect on the yields of these grains.

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IMPROVEMENTS IN THE NYLON METHOD OF MEASURING SOIL MOISTURE IN THE FIELD.

By George John Bouyoucous; Agron. Jour., Vol. 44, No. 6, pp. 311-314. June 1952.

Very important improvements have been made in the nylon unit for making a continuous measurement of soil moisture in the field. One improvement deals with the mechanical construction of the unit. The second pertains to the materials that comprise the unit. The third involves the calibration and the installation of the unit in the soil.

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MESQUITE CONTROL, COOPERATIVE RANCH TESTS, 1950-51

By C. E. Fisher, Wm. M. Phillips, C. H. Meadors, Jr., R. A. Darrow and W. G. McCully; Texas Agr. Expt. Sta. Prog. Rpt. 1465. May 27, 1952.

This is a report on cooperative ranch tests to develop information on the effectiveness and value of chemicals for the control of mesquite over a wide range of different growth forms, environment and climatic conditions.

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REACTION OF WHITE BRUSH TO GROWTH-REGULATOR HERBICIDES.

By W. G. McCully, James A. Tynan and Bruce A. Perry; Tex. Agr. Expt. Sta. Prog. Rpt. 1462. May 12, 1952.

White brush is not responsive to growth-regulator herbicides currently used for brush control. Excellent top kill and some root kills have been obtained from these compounds, but the results are not consistent. The most effective time of treatment is during a period of active growth. Dormant treatments involving high rates of applications have not been successful.

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IRRIGATION MANAGEMENT INVESTIGATIONS ON NONSALINE SOILS.

By A. W. March, L. R. Swarner, F. M. Tileston, C. A. Bower and E. N. Hoffman; Ore. Agr. Expt. Sta. Tech. Bul. 23, March 1952.

In the application of irrigation water to arid lands, many and far reaching changes of both physical and economic nature become involved. Concurrent with creating a favorable environment for the production of a wide variety of crops, problems often arise due to inherent soil characteristics or other natural causes. These problems may not become apparent until water is applied to the land or even after a considerable period of land development.

Delivery of water to new lands, on the Owyhee Project of eastern Oregon, starting in 1935, presented problems of slow water absorption by the soil and surface runoff which in general were not present on the previously irrigated lands. These soil consitions, often associated with topography, created problems of irrigation operations and of water delivery as the excessive runoff gave rise to unexpected demands on the water supply.

This bulletin presents the results of research undertaken on a cooperative basis towards an understanding and improvement of these difficult problems. Management practices were developed during the course of the investigation which should aid farmers in satisfactorily using these lands with less difficulty in ther irrigation operations.

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HYDRAULICS OF WELLS.

By Dean F. Peterson, Jr., Orson W. Israelsen and Vaughn E. Hanson; Utah Agr. Expt. Sta. Bul. 351. March 1952.

This bulletin is concerned largely with new developments for the study of steady flow or equilibrium ground-water flow conditions.

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ESTIMATES OF IRRIGATION WATER REQUIREMENTS FOR CROPS IN NORTH DAKOTA.

By Sterling Davis, Norman A. Evans and Arlon G. Hazen; N. D. Agr. Expt. Sta. Bul. No. 377. May 1952.

In recognition of an urgent need for information concerning quantities of irrigation water required for satisfactory crop growth in each of several areas in North Dakota, this report outlines a procedure for estimating, and actual estimates of, these quantities for various crops. It is intended that sufficient estimates be included to answer general requirements, and that the procedure used be sufficiently explained so that technicians can readily use it for more detailed local estimations as the need arises.

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NATOB - A NEW BUSH LESPEDEZA FOR SOIL CONSERVATION.

By Franklin J. Crider; USDA Cir. No. 900. March 1952.

This circular describes a new and improved strain of common Lespedeza bicolor.

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CONSUMPTIVE USE AND IRRIGATION WATER REQUIREMENTS OF CROPS IN SOUTH DAKOTA.

By Leonard J. Erie; USDA, SCS, Multi. March 1952.

Information contained in this report gives the total amount of water normally consumed by the crops, that supplied by precipitation and that which must be supplied by irrigation for optimum crop growth.

It is recognized that each farm is a distinct unit of operation and that the irrigation requirements for specific crops will depend upon the site conditions on each farm. The values presented in this report provide a good starting point for technicians, farm planners and irrigators to estimate the water needs.

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EFFECT OF 2,4,5-T ON YOUNG COTTON PLANTS.

By Wayne J. McIlrath and David R. Ergle; Texas Agr. Expt. Sta. Prog. Rpt. 1464. May 24, 1952.

Although this study showed that cotton is sensitive to small amounts of 2,4,5-T, it also indicated that a greater quantity of this herbicide than of 2,4-D is required to reduce the yield of seed cotton. For example, while 0.04 mg. of 2,4-D per plant (1 ounce per 35 acres) reduced the yield by approximately 76 percent, five times this amount of 2,4,5-T caused no significant change in yield, and 10 times this quantity resulted in only about a 41 percent reduction.

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PEANUT PRODUCTION PRACTICES IN SOUTHEASTERN ALABAMA.

By J. Homer Blackstone; Ala. Agr. Expt. Sta. Cir. No. 108. June 1952.

This report describes current peanut production practices in southeastern Alabama, indicates variation in these practices, and compares present practices with recommendations of the Alabama Agricultural Experiment Station.

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HILL GRASSLAND FOR BEEF PRODUCTION.

By H. L. Borst, Paul Gerlaugh and Myron Bachtell; Ohio Agr. Expt. Sta. Res. Cir. 15. April 1952.

Beef production investigations for forage produced on rejuvenated hillsides were carried on for 5 years. Native feeders which were purchased in the fall and wintered on grass-legume hay, were finished on pasture the following season with supplemental feeding of corn and cob meal which averaged 6.8 bushels per steer. Pastures consisted of permanent bluegrass for fall and spring and long-lay meadow type grass-legume pastures which were established on the hillsides by trash mulch seeding. The latter furnished some of the hay for winter feed as well as summer grazing.

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IRRIGATED PASTURES PRODUCE MORE PROTEIN AND TOTAL FORAGE

By O. E. Sell; Ga. Agr. Expt. Sta. Res. News, Vol. 3, No. 7, pp. 1 and 3. July 1952.

Over four tons of high quality dry forage produced with irrigation and complete fertilization. Supplementary irrigation in summer of Bermuda-Ladino clover pasture increased the production of dry forage 27 percent and the production of protein 67 percent. The increased forage and, particularly, the increased protein production was due largely to the fact that there was greater survival and growth of Ladino clover throughout the summer with irrigation than without.

Heavier rates of fertilization and more complete fertilization of pastures is necessary with irrigation. For example, fertilization with phosphate and lime was adequate for a few years without irrigation; but the increased forage produced with irrigation depleted the supply of available soil potash so that forage production could not be held at a high level unless potash was applied in addition to phosphate and lime.

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WOOD CHIPS FOR THE LAND.

By Arthur C. McIntyre; USDA, SCS, Leaflet No. 323. 1952.

This leaflet describes a number of machines that convert large pieces of wood from farm woodlot or mill into chips or shreds. It also discusses some of the more important uses being made of these chips on the farm.

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PRODUCTIVE SOILS NEED MORE FERTILIZER.

By H. B. Vanderford; Better Crops with Plant Food, Vol. 36, No. 6, pp. 15-18, + 40. June-July 1952.

Increased production per acre offers the best possibility of meeting our increased requirements of farm products. Stability of soils for the production of the various crops is a logical criterion on which to group soils into land classes where high production is the major objective. Available research data show that general fertilizer and other recommendations are best for a certain range of soils and not best for other soils. The most productive soils can generally use more fertilizers efficiently than the less productive soils.

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FALLOW AND THE WIND EROSION HAZARD.

By C. E. Van Doren and W. C. Johnson; USDA, SCS-TP-111. June 1952.

Fallow in the cropping system stabilizes crop production and thus helps to produce a more dependable year-in and year-out farm income. With stubble mulch tillage you can expect to have about 60 percent of the residue still on the surface after ayear of fallow. The effectiveness of a surface mulch or residue in controlling wind erosion is a matter of common knowledge. All other factors being equal, the system of handling land which will keep the most residue on the surface will be the most desirable from the standpoint of erosion control. This study emphaszies the much greater amount of crop residue left on the surface with subtillage as compared with one-waying. Maintaining the maximum amount of surface residue means the use of stubble-mulch tillage for all plowing and tillage operations regardless of the amount of residue produced. If properly managed, heavy residues will carry over into the second year, an important consideration, when wheat fails to produce a protective cover or there is a crop failure.

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WHY HAS INDIANGRASS BEEN OVERLOOKED?

By C. B. Webster; Sheep & Goat Raiser, Vol. 32, No. 9, pp. 18-19. June 1952.

The greatest economic value of Indiangrass is as a range, pasture and meadow grass where it can serve soil and moisture conservation well. It is native to every state from North Dakota to Arizona and eastward to the Atlantic Coast. Both the beauty and utility of Indiangrass have been almost overlooked until recently. It seldom grows in pure stands. It is most often found in company with big and little bluestem and switchgrass. It is an important component of our tall grass prairie.

Indiangrass is a very good hay grass producing one to two tons per acre, more if well fertilized. Grown for seed it will produce 100 to 300 pounds per acre. It is an important range grass especially for central Texas and Oklahoma. It can be grown with relative ease as a cultivated crop for seed, hay, meadow and pasture. It is one of the best of the native tall grasses. It fits perfectly into the conservation revegetation picture.

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IRRIGATION AND OTHER CULTURAL STUDIES WITH CABBAGE, SWEET CORN, SNAP BEANS, ONIONS, TOMATOES AND CUCUMBERS.

By V. F. Nettles, F. S. Jamison and B. E. Janes; Fla. Agr. Expt. Sta. Bul. 495. June 1952.

Sprinkler irrigation experiments were conducted over a six-year period with cabbage, sweet corn, snap beans, onions, tomatoes and cucumbers. Results of these tests emphasize the advisability of growing vegetables in areas where adequate provisions can be made for irrigation. Supplemental irrigation did not result in increased yield of crops for all seasons, but in some years or seasons it was responsible for the difference between a successful harvest and crop failure. Such variations in response can be explained partly by the level and distribution of rainfall during the growing season and partly by type of crop grown.

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EFFECTS OF DRAINAGE ON AGRICULTURAL PRODUCTION.

By L. P. Jones; Agr. Eng., Vol. 33, No. 7, pp. 415-416. July 1952.

This paper presents data for a few specific farms showing the effect of drainage on increased crop yields and farm incomes.

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EVAPOTRANSPIRATION ESTIMATES AS CRITERIA FOR DETERMINING TIME OF IRRIGATION.

By C. H. M. van Bavel and R. V. Wilson; Agr. Eng. Vol. 33, No. 7, pp. 417-418, +420. July 1952.

This paper presents a method in which evapotranspiration and measurement of rainfall can be used for the basis of determining the amount of moisture in the soil and irrigation practices in the humid land.

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THE CORNELL SOIL PENETROMETER.

By C. W. Terry and H. M. Wilson; Agr. Eng., Vol. 33, No. 7, p. 425. July 1952.

This paper describes a self-recording soil penetrometer.

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INFLUENCE OF ORGANIC MATTER ON AERATION AND STRUCTURE OF SOIL.

By J. H. Quastel; Soil Sci., Vol. 73, No. 6, pp. 419-426. June 1952.

The author discusses various constituents of organic matter thought to be able to affect the aggregate structure of the soil.

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EFFECT OF SYNTHETIC POLYELECTROLYTES ON AGGREGATION, AERATION, AND WATER RELATIONSHIPS OF SOIL.

By R. M. Hedrick and D. T. Mowry; Soil Sci., Vol. 73, No. 6, pp. 427-441. June 1952.

Synthetic water-soluble polyelectrolytes were synthesized which are extremely effective aggregate cementing agents. When a polyanion, such as hydrolyzed polyacrylonitrite, is applied at rates of 0.01 to 0.1 percent to soil of poor structure, the aggregate analysis as determined by wet-sieving is increased, the working properties are improved, and other characteristics commonly associated with good structure are developed.

The treatment increases infiltration and percolation of water and thus reduces runoff. Faster plant growth and earlier maturity of plants in treated soil have been found. Significant yield increases of radishes, carrots, and other crops have been obtained in treated soil. Treatments have remained effective for more than 2-1/2 years.

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EFFECT OF SYNTHETIC POLYELECTROLYTES ON THE STRUCTURE OF SALINE AND ALKALI SOILS.

By L. E. Allison; Soil Sci., Vol. 73, No. 6, pp. 443-454. June 1952.

Laboratory tests were made on several saline and alkali soils to determine the aggregating effectiveness of synthetic polyelectrolytes CRD-186 and CRD-189. The conditioners were applied in solution at rates of 0.025 and 0.1 percent by spraying the solution into dry soil, followed by

mixing to facilitate aggregation. Marked increases in permeability in proportion to rate of treatment resulted.

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SOIL AND CROP RESPONSES FROM FIELD APPLICATIONS OF SOIL CONDITIONERS.

By W. P. Martin, G. S. Taylor, J. C. Engibous, and E. Burhett; Soil Sci., Vol. 73, No. 6, pp. 455-471. June 1952.

The effect of Krilium soil conditioners on the physical properties of heavy textured Miami, Crosby, Brookston, and Paulding soils was studied Applications at rates varying from 0.02 to 0.2 percent and in powder form to these soils in the field, with subsequent mixing by disking and rototilling, without exception increased soil aggregation and such related characteristics as porosity and permeability. Not all crops responded to treatment, although in many instances yields increased appreciably.

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EFFECT OF SYNTHETIC SOIL CONDITIONERS ON EROSION CONTROL.

By Lloyd E. Weeks and William G. Golter; Soil Sci Vol. 73, No. 6, pp. 473-484. June 1952.

Preliminary tests indicate surface soil can be satisfactorily stabilized to the erosive action of rainfall by treating the surface with hydrolyzed polyacreylonitrite. This application serves as a temporary method for controlling erosion until vegetation can become established.

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SOIL MOVEMENT BY RAINDROPS.

By George R. Free; Agr. Eng., Vol. 33, No. 8, pp. 491-494, +496. Aug. 1952.

This paper describes and discusses the technique used and some of the results obtained, in a study of the movement of soil by raindrops. Their application to the more general problems of runoff and soil erosion is discussed. The studies were a part of the overall problem including such factors as exposure, difference in soils, and effects on certain physical characteristics of soil.

Splash losses from elevated pans of bare Honeoye soil were from 50 to 90 times wash-off losses. The average loss per inch of rain amounted to from 5 to 7 tons per acre. A straw mulch reduced loss to one-fiftieth from bare soil and wash-off to one-third. A marked decrease in infiltration occurred despite the fact that most of the splashed soil left the pans.

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POTENTIAL "DUST BOWL" IN THE MAKING.

By C. A. Richardson; Jour. Soil & Water Conserva. Vol. 7, No. 3, pp. 111-112. July 1952.

Drought, large acreage of land planted to cotton with resulting unprotected soils, and high winds have combined to create a serious condition in the southern end of the High Plains of Texas. Fortunately, winds subsided in intensity during early June, but drought continues to hamper the cropping in the rich cotton area.

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SOME RELATIONSHIPS OF PRECIPITATION AND SOIL LOSS ON SMALL AGRICULTURAL WATERSHEDS.

By F. R. Dreibelbis; Jour. Soil & Water Conserva. Vol. 7, No. 3, pp. 113-116, +127. July 1952.

A knowledge of the relation of certain rainfall characteristics to soil erosion is needed to aid in the solution of soil and water conservation problems. A study of such relationships has revealed that the monthly amounts of rain falling at high rates of intensity are greatest in June and July followed by May, August, and September for the Coshocton, Ohio area. There appears to be little correlation between annual and monthly precipitation with soil erosion. A direct correlation was revealed when amounts of rain falling at the higher intensities were compared with amounts of erosion. Soil conservation practices have reduced soil loss to a considerable extent as shown by data obtained from paired small 2-acre watersheds for the period 1939-1950.

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SKID-ROAD EROSION CAN BE REDUCED.

By Sidney Weitzman and G. R. Trimble, Jr.; Jour. Soil & Water Conserva., Vol. 7, No. 3, pp. 122-124. July 1952.

Skid-road erosion can be reduced by planning an efficient road lay-out that avoids steep gradients, and by installing simple water bars to keep the road drained. These recommendations are based on studies of an experimental logging job in West Virginia, where four different kinds of skid were tested.

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RANGE SOIL CONDITIONS INFLUENCE WATER INTAKE.

By Ben Osborn; Jour. Soil & Water Conserva., Vol. 7, No. 3, pp. 126-132. July 1952.

One of the big opportunities for conserving water on range lands of the West is to manage grazing, to develop and maintain favorable cover and soil conditions for storing rain where it falls. This will use the moisture for producing feed for livestock while reducing erosion, flood, and siltation problems resulting from excessive runoff. Some of the potentialities in this phase of the conservation program are suggested in the photographs and examples presented.

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TIMBER AND FORAGE PRODUCTION IN A PINE-HARDWOOD STAND IN TEXAS.

By Robert R. Rhodes; Jour. of Forestry, Vol. 50, No. 6, pp. 456-459. June 1952.

Unmanaged pine-hardwood timber stands on loamy soils in Montgomery County, Texas with 90 to 115 square feet of basal area appear to produce the best combination of wood volume, forage, and brouse. Under this condition wood production amounted to 41 cubic feet, herbaceous forage 51 and brouse 205 pounds per acre. Precipitation was deficient during the seasons of 1947 and 1948 when the study was made.

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YIELD AND VALUE OF WATER FROM WESTERN NATIONAL FORESTS.

By Edward N. Munns; Jour. of Forestry, Vol. 50, No. 6, pp. 464-468. June 1952.

This paper discusses the yield and value of water from western National forests.

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GRASS PRODUCTION DOUBLED BY CONTROL OF SCRUB OAK.

By John T. Cassidy; Jour. of Forestry, Vol. 50, No. 6, pp. 462-463. June 1952.

The yield of bluestem forage grasses more than doubled within three seasons after scrub hardwoods were controlled in Louisiana. Under well-managed grazing, the increase in forage can repay most of the cost of hardwood control before the pines reach merchantable size.

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USE OF ALLYL ALCOHOL FOR WEED CONTROL IN FOREST NURSERIES.

By T. E. Maki and R. M. Allen; Jour. of Forestry, Vol. 50, No. 6, pp. 470-471. June 1952.

Allyl alcohol was used successfully at one small nursery in Mississippi over a 4-year period. It reduced early weed population without impairing field perdormance of seedlings. It takes time to apply, requires a lapse of at least 3 days between treatment and sowing, and heavy rains and wind may contaminate bed surfaces with weed seeds after treatment. Fairly elaborate precautions are essential for safe application.

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THE HYDRAULIC FUNCTION OF FOREST SOILS IN WATERSHED MANAGEMENT.

By Peter W. Fletcher; Jour. of Forestry, Vol. 50, No. 5, pp. 359-362. May 1952.

The hydraulic function of a forest is to equalize streamflow, so that very high and very low flow stages are exceptional events. A soil profile developed under the influence of a climax forest is the hydrologic ideal from a flood control standpoint. Its porous permeable structure offers maximum opportunities for rainfall to be transmitted to deep groundwater storage and to be temporarily detained in the soil profile, from streamflow. In addition it offers maximum opportunities for permanently retaining water from streamflow by providing maximum soil moisture deficits created by the transpirational draft of dense, deep-rooted vegetation.

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WATERSHED-MANAGEMENT ASPECTS OF THINNED YOUNG LODGEPOLE PINE STANDS.

By B. C. Goodell; Jour. of Forestry, Vol. 50, No. 5, pp. 374-378. May 1952.

Thinning of dense young lodgepole pine stands increased net precipitation while not increasing soil-moisture losses. Where climatic and forest conditions are similar to those studied, thinning of dense pine stands should appreciably increase water yields.

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THE INFLUENCE OF PLANTS ON THE MINERALIZATION OF NITROGEN AND THE MAINTENANCE OF ORGANIC MATTER IN THE SOIL.

By J. J. Theron; The Jour Agr. Sci., Vol. 41, No. 4, pp. 289-296. Oct. 1951.

The influence of growing plants on nitrification in the soil was studied by means of small lysimeters of which four were planted to perennial grass, four to an annual millet crop and four were left to fallow. Nitrification was entirely repressed under the grass from the second season after its establishment onwards, and did not take place even when the grass was dormant in winter. This was due to a direct influence of the living root, since in the fallow soil which was treated similarly, nitrification took place freely throughout the winter. Under the usual crop a repression of nitrification could be detected only towards maturity of the crop and the soil solution was completely depleted of nitrates at this period. Nitrification was resumed, however, immediately after the crop was ripe and had dried off and continued through the winter.

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THE BEHAVIOR OF NITROGENOUS MANURES IN THE SOIL: I. THE LOSS OF MANURIAL NITROGEN.

By Harold H. Mann and T. W. Barnes; The Jour. Agr. Sci., Vol. 41, No. 4, pp. 309-314. Oct. 1951.

An attempt was made to determine what becomes of the nitrogen added to poor soil in moderate quantities of organic manures or of annonium sulphate. Losses by drainage, in two successive barley crops, and by fixation in an unavailable form in the

soil were determined, and it was found that with every material used and with intensive cropping and leaching, not more than 40 to 45 percent of the added nitrogen could be accounted for at the end of the experimental period.

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EFFECT OF WINTER BURNING ON GROWTH OF SLASH PINE IN THE FLATWOODS.

By George F. Gruschow; Jour. of Forestry, Vol. 50, No. 7, pp. 515-517. July 1952.

The information presented in this paper shows that headfires should not be prescribed wherever slash pine is a desired component of the stand and slash pine reproduction is becoming established, as is the case with many presently understocked stands in the flatwoods. However, prescribed burning with a backfire under unfavorable conditions in slash pine over approximately 12 feet high results in negligible loss of growth.

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DETERIORATION OF SITE QUALITY BY EROSION.

By Joseph Kittredge; Jour. of Forestry; Vol.50, No. 7, pp. 554-556. July 1952.

When erosion reaches the stage of noticeable gullies, the site indexes of plantations of black locust and of loblolly, slash and shortleaf pines are heavily reduced in comparison with plantations on old fields, doubtless also eroded but not to the gully stage.

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RESPONSE OF LOBLOLLY PINE TO THINNING.

By William F. Mann, Jr.; Jour. of Forestry, Vol. 50, No. 6, pp. 443-446. June 1952.

This study suggests that thinning practices best suited to loblolly production are not necessarily the most profitable where pulpwood is the main objective.

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PRE-HARVEST CHEMICAL TOP KILLING OF LEGUME SEED CROPS: II. GENERAL EFFECTS OF CYANAMIDE COMPOUNDS.

By G. S. Cooper and W. G. Corns; Sci. Agr., Vol. 32, No. 5, pp. 281-284. May 1952.

This paper discusses the use of cyanamide compounds for top-killing of legume seed crops. Of the cyanamide chemicals tested, potassium cyanate and sodium cyananial were outstanding as top-killers when applied in spray form. Although smaller amounts of potassium cyanate were effective in comparison with sodium cyanamial the latter is somewhat more caustic, hence more rapid in action and in addition is likely to be cheaper.

A SELF-PROPELLED HERBICIDE SPRAYER FOR EXPERIMENTAL PLOTS.

By R. H. Cunningham; Sci. Agr., Vol. 32, No. 5, pp. 285-288. May 1952.

A small self-propelled herbicide sprayer constructed to meet therequirements of experimental plot work isdescribed. The machine weighs 135 pounds and is easily operated by one man. Several acres a day can be covered. Spraying pressure holds constant and coverage is uniform. It will travel between rows or on pathways eliminating damage to plants.

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THE EFFECT OF SMALL ADDITIONS OF ELEMENTAL SULPHUR ON THE AVAILABILITY OF PHOSPHATE FERTILIZER.

By J. Mitchell, J. E. Dehm and H. G. Dion; Sci. Agr. Vol. 32, No. 6, pp. 311-316. June 1952.

Greenhouse tests showed that a relatively inefficient phosphate carrier for neutral to alkaline soils such as 8-30-0 dicalcium phosphate-nitrate could be greatly improved as a supplier of phosphate to cereals by the addition of small amounts of elemental sulphur. Field experiments in 1950 where sulphur was treated with an infusion from a soil, manure and peat mixture to which sulfur had been added previously gave significant increases in the uptake of phosphorus where 8-30-0 plus treated sulphur was used, but not where untreated sulphur was used.

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EFFECT OF 2,4-D ON QUALITIES OF WESTERN CANADIAN WHEAT, BARLEY, AND OATS.

By T. R. Aitken, W. O. S. Meredith, and R. Y. Olson; Sci. Agr., Vol. 32, No. 6, pp. 317-332. June 1952.

This paper presents data for typical varieties of western Canadian wheat, barley, and oats grown at one location and treated with different formulations and dosages of 2,4-D at various stages of plant growth. The effect of the sodium salt, amine, and ester formulations on grade, bushel weight, and protein content of different varieties grown in 1948 and 1949 are given in Part I of the paper. Part II of the paper deals principally with the effect of the ester formulation on the baking and dough properties of Redman wheat and on the malting properties of Montcalm barley.

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MECHANISM OF CLAY AGGREGATION BY POLYELECTROLYTES

By R. A. Ruehrwein and D. W. Ward; Soil Sci., Vol. 73, No. 6, pp. 485-492. June 1952.

Polycations, but not polyanions, are adsorbed in

the interplanar spacing of the expanding lattice clay montmorillonite. Sodium polymethacrylate, a polyanion, is slowly adsorbed on kaolinite clay up to a level of about 2 me. per 100 gm. The degree of adsorption depends somewhat upon the concentration of extraneous electrolyte.

Polycations are very effectiveflocculating agents and floe-stabilizing agents for clay. Polyanions are not flocculating agents but they are effective stabilizing agents for flocculated clay. Sodium polymethacrylate functions as a stabilizing agent of clay aggregates by binding the particles together. The polymer molecules are sufficiently long to bridge the gap between clay particles, and they are capable of strongly adsorbing on the clay to form anchor points for the bridge. The adsorption process is probably one of ion exchange.

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ON THE DETERMINATION OF TRANSMISSIBILITY AND STORAGE COEFFICIENTS FROM PUMPING TEST DATA.

By Ven Te Chow; Trans. Amer. Geo. Union, Vol. 33 No. 3, pp. 397-404. June 1952.

This paper presents a graphical procedure for determining the formation constants of an artesian aquifer from pumping test data. The procedure is based on the principle that the coefficient of transmissibility is determined by the ratio of the drawdown on its rate of change with respect to the logarithm of the time since pumping started, of $s/(\delta\ s/\delta \log_{10} t)$, use being made of the non-equilibrium theory. The computation of formation constants may be performed in two ways, and their results should be checked against each other. A numerical example is given to illustrate the application of the procedure.

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SOME EFFECTS OF FIRE AND ASH ON THE INFILTRATION CAPACITY OF SOILS.

By R. H. Burgy and V. H. Scott; Trans. Amer. Geo. Union, Vol. 33, No. 3, pp. 405-416. June 1952.

A large portion of the lands in the foothill areas of the southwest United States are covered with brush, commonly referred to as chaparral. Conversion of certain portions of these areas to grazing lands by the use of fire is considered one of the most expeditious means. The effects of burning brush on the soil surface and the resulting influence on the infiltration rate of the soil have been studied by a few investigators. In an effort to obtain further knowledge on this subject, the authors undertook a series of experiments both in the field and laboratory. These experiments were designed specifically to determine what effects fire andash have on water-intake characteristics of soils.

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FRESH WATER FROM SALT WATER.

By Everett D. Howe; Trans. Amer. Geo. Union, Vol. 33, No. 3, pp. 417-422. June 1952.

This paper surveys the several proposals for refining sea water, including compression distillation, multiple-effect distillation, the electrolytic process, ionic exchange, freezing, solar distillation, and the thermal-difference power plant. Cost estimates and design information lead to the conclusion that none of the methods using fuel as a source of heat or power is feasible at the present time. Consideration of the use of waste heat from power plants for the distillation of sea water gives hope that such developments could be used to avoid drought conditions by supplementing existing water supplies.

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A RIGOROUS, SIMPLE METHOD OF MEASURING AND RECORDING PARTICLE-SIZE DISTRIBUTION IN DISPERSED MATERIAL.

By M. Rim; Trans. Amer. Geo. Union, Vol. 33, No. 3, pp. 423-426. June 1952.

In all conventional methods for particle-size distribution analysis, measuring gear is introduced or permitted to be present in a suspension of settling particles. This inevitability causes inhomogeneity and gravitational instability in the suspension with the result that the most interesting and relevant features of the particle size distribution curve are wiped out.

Here an apparatus is described where only external measurements have to be taken on a column of settling particles, and stability is rigorously maintained by the employment of an additional liquid. The design is simple enough to make this method not only suitable for reference purposes but also equipment- and effort-saving in routine determinations. It was combined with a bead-recorder, necessitating no photographic work and almost no mechanical parts.

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WHY AND HOW MUCH LIME FOR YOUR LAND.

By A. Mehlich; N. C. Agr. Expt. Sta. Research and Farming, Vol. 10, No. 1, pp. 12-13. Summer 1951.

This paper points out that plants vary in their lime needs, that soils vary in acidity, that calcium in organic form is more effective than when in mineral form, and that soil particles attract plant nutrients. It explains how to determine the amount of lime needed for a given soil to be cropped to a specific crop.

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CHEMICAL CONTROL OF WEEDS IN SOUTH DAKOTA.

By Lyle A. Derscheid and L. M. Stahler; S. D. Agr. Expt. Sta. Cir. 94. March 1952.

There are many chemicals now on the market that have possibilities for use in weed control. This circular explains the use and value of the more important chemicals.

Recommendations are based on experimental results from cooperative tests in South Dakota and from those reported at the North Central Weed Control Conference. The tests in South Dakota include 49 sets of plots established throughout the state from 1945 to 1950, work conducted at the Weed Research Farm at Scotland from 1946 to 1950, work conducted at Brookings from 1947 to 1951 and at a Weed Research Farm near Gary which was established in 1950.

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EFFECTS OF 2,4-D AND CADE, SINGLY AND IN COMBINATION, UPON NITRATE AND BACTERIAL CONTENT OF SOILS

By H. Koike and P. L. Cainey; Soil Sci., Vol. 74, No. 2, pp. 165-172. Aug. 1952.

2,4-D, CADE(concentrated activated diesel emulsion), and the combination of 2,4-D and CADE applied to sandy loam and silt loam soils at the usual field rates of 3 pounds, 100 and 500 gallons, and 30 gallons per acre, respectively, did not appreciably reduce the total nitrates that accumulated during different intervals - although there were marked temporary reductions in the total nitrates accumulating in samples treated with high concentrations of the herbicides, the accumulation of nitrate nitrogen was not completely inhibited, and within 8 to 16 weeks the rate of accumulation in most instances had again reached that in untreated soils.

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INSTRUMENT FOR DETERMINATION OF TREE DIAMETERS IN INCHES AT ANY HEIGHT.

By C. H. Vaux; Jour. of Forestry, Vol. 50, No. 8, pp. 601-604. Aug. 1952.

This paper describes an instrument which can be used in determining tree diameters in inches at any height. When mounted on a Jacob Staff, any careful operator can obtain diameter measurements at any visible point on a tree with sufficient accuracy for the majority of purposes. When held free in the hand, a skillful operator can obtain diameter measurements at any visible point on a tree with accuracy sufficient for most purposes for which such measurements are used.

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FOREST AND SHELTERBELT PLANTINGS IN THE UNITED STATES - 1951.

By Roland Rotty; Jour. of Forestry, Vol. 50, No.8 pp. 605-608. Aug. 1952.

Forest and shelterbelt planting by all individuals and agencies during the planting year 1951 amounted to 456,360 acres -- a decrease of 41,100 acres or 9 percent from the 1950 figure.

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YOUR GREATEST OPPORTUNITY IS GRASS.

By Will M. Myers; Country Gentleman. Aug. 1952.

This is the story of one of the greatest opportunities ever to come within the reach of farmers of the United States - a means to (1) produce far more than you're turning out today, (2) produce it with less labor and more stable profit possibilities than ever before, and (3) preserve and build up your soil at the same time.

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SOD COVER FOR PEACH ORCHARDS HELPS UTILIZE ERODED AREAS FOR PRODUCTION.

By Robert G. Hill, Jr.; Ohio Agr. Expt. Sta. Farm & Home Res., Vol. 37, No. 277, pp. 53-+67. July-Aug. 1952.

A peach orchard was established in 1944 to compare the value of the conventional practices to that of a sod system. Also to determine what adjustments, if any, should be made in the nitrogen fertilization program for sod grown peaches.

The check portions of the orchard were maintained under normal cultivation with a winter cover of rye and a summer cover soybeans. Trees in these cultivated areas received annual applications of nitrogen fertilizers at the rate of one-fourth pound of a 16 percent nitrogen carrier per year of tree age or the equivalent. The remainder of the orchard was maintained under a bluegrass sod which was mowed several times during the growing season. Clippings were allowed to remain on the orchard floor.

It appears that the sod system of culture with peaches can be expected to produce growth and yields comparable to that obtained under cultivation or cultivation with cover crops, provided there is sufficient available moisture and the normal rate of nitrogen fertilization is doubled.

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GOOD PASTURE IS FARMER'S SOURCE OF CHEAPEST LIVESTOCK FEED.

Ohio Agr. Expt. Sta., Farm & Home Res., Vol. 37, No. 277, p. 62, +64. July-Aug. 1952.

As a result of pasture studies conducted from 1935 to 1941 it was found that the increase in productive level of the soil was the most profitable of all the factors tested. For example, paddocks receiving lime, fertilizer, and manure

applied at an average cost of $4.00 (prewar prices) per acre per year outyielded the untreated ones seeded with the same mixture by 250 pounds of beef per acre per year. The same procedure with dairy cattle resulted in the equivalent of an additional 2,100 pounds of 3.5 percent milk.

Crops in the treated paddocks started growing earlier, suffered less damage in mid-summer, and grew later in the fall. One reason was that the open soil structure under good sod allowed more rain water penetration.

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CHARACTERISTICS OF SOME PODZOLIC SOILS OF THE NORTHEASTERN UNITED STATES.

By W. H. Lyford; Soil Sci. Soc. Amer. Proc., Vol. 16, No. 3, pp. 231-235. July 1952.

Podzols, Brown Podzolic, Gray-Brown Podzolic, and Red-Yellow Podzolic soils are the zonal soils of greatest extent in the 12 Northeastern States. This paper reviews briefly the characteristics of these zonal soils, indicates current ideas, and points out some possible long time trends in genesis. The paper is a summary of many field observations in the area by the author.

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THE INFLUENCE OF SOIL MOISTURE CONDITION ON THE UPTAKE OF PHOSPHORUS FROM CALCAREOUS SOILS BY SUGAR BEETS

By Jay L. Haddock; Soil Sci. Soc. of Amer., Proc. Vol. 16, No. 3, pp. 235-238. July 1952.

Field experiments were conducted during 4 years on irrigated calcareous soils in Utah, from which data on the soluble phosphorus content of sugar beet petioles were related to soil moisture condition and fertilizer application. In addition, during 1950, the relationships between fertilizer placement and soil moisture condition upon phosphorus uptake were determined using $P_{22}$ tagged superphosphate. On August 20, 1947 sugar beet petioles obtained from beets growing on soils indicating about 1,000, 10,000 and 100,000 ohms resistance contained approximately 13,000, 900, and 500 ppm of phosphorus respectively. Phosphorus fertilizer placed in bands 6 inches below the soil surface and 4 inches to the side of beets was more readily available to sugar beet plants than broadcast phosphorus at all soil moisture conditions studied, early in the season. High concentration of available soil nitrogen and high soil moisture tension are conditions hindering the uptake of soil phosphorus.

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COLLOIDAL PROPERTIES OF SOILS FROM WESTERN EQUATORIAL SOUTH AMERICA.

By E. V. Miller and N. T. Coleman; Soil Sci. Soc. Amer. Proc., Vol. 16, No. 3, pp. 239-244. July 1952.

Equatorial soils of Ecuador and Peru were studied by chemical, differential thermal, and X-ray spectrographic methods of analysis with the aim of clarifying their classification and fertility properties. A classification key permits the presentation of the soils and their properties according to major soil groups.

In the humid tropical regions kaolin clays are common, but there is also evidence of juvenile soils. Immaturity is indicated by high contents of exchangeable bases, presence of clays with high cation exchange capacities, evident lack of crystallinity of the clays, and pH values which are relatively low for the existing degree of base saturation. Dark colored acidic Andean soils possess high phosphate retaining capacities and high exchangeable aluminum. Their C/A capacity ratios are less than 1. Soils of the drier equatorial regions contain crystalline clay minerals of the 2:1 lattice families.

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THE INFLUENCE OF SOIL MOISTURE TENSION OF VAPOR MOVEMENT OF SOIL WATER.

By Harold E. Jones and Helmut Kohnke; Soil Sci. Soc. Amer. Proc., Vol. 16, No. 3, pp. 245-252. July 1952.

The intent of this research was to study the role of soil mositure tension in water vapor movement within the soil. All studies were conducted in the laboratory. Vapor movement was effected by vapor pressure differences obtained through the application of a sharp temperature interface at the midpoint of horizontal soil columns. The influences of such factors as soil porosity, initial moisture content, and vapor pressure gradients were determined.

The movement of water vapor in the two soils and four soil separates studied increased rapidly with moisture tension up to a certain level, then decreased sharply. The pF at which vapor movement was initiated and at which maximum movement occurred increased with a decrease in particle size The volume of unsaturated soil pores, not their size seems to govern the soil moisture content at which vapor movement begins.

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THE INFLUENCE OF APPLIED BORON, MAGNESIUM AND POTASSIUM ON THE GROWTH AND CHEMICAL COMPOSITION OF RED CLOVER GROWN UNDER GREENHOUSE CONDITIONS.

By T. C. Tucker and F. W. Smith; Soil Sci. Soc. Amer. Proc., Vol. 16, No. 3, pp. 252-255. July 1952.

The objective of this investigation was to determine by means of greenhouse experiment the influence of application of boron, magnesium, and potassium on the yield and chemical composition of red clover grown on Kansas soils.

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EFFECT OF SODIUM ION ON SYNTHETIC WATER-STABLE AGGREGATES.

By Andrew P. Mazurak; Soil Sci. Soc. Amer. Proc., Vol. 16, No. 3, pp. 256-258. July 1952.

Particles of diameter $< 0.15\mu$ were separated from Hesperia sandy loam and electrodialyzed. Proper quantities of 0.1 N NaOH were added to the electrodialyzed suspensions so that the symmetry-concentrations, S, of Na+ were 0.0625, 0.125, 0.25, 0.50, 1.0 and 2.0. Each suspension was dried to induce aggregation. The dry synthetic aggregates were then analyzed for their water-stability by shaking them in water for 2-, 20-, 200-, and 2000-minutes. After each shaking period a size distribution of aggregates was obtained.

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THE EFFECT OF AMMONIUM NITRATE APPLICATIONS TO FIELD SOILS ON NODULATION, SEED YIELD, AND NITROGEN AND OIL CONTENT OF THE SEED OF SOYBEANS.

By J. C. Lyons and E. B. Earley; Soil Sci. Soc. Amer. Proc., Vol. 16, No. 3, pp. 259-263. July 1952.

A 2-year field study was conducted to determine the possibility of supplementing soil and symbiotically-fixed nitrogen of soybeans with nitrogen fertilizer. In 1947, during a hot dry growing season, marked responses were obtained from added nitrogen. The number of nodules per plant decreased 80 to 90%, there were appreciable increases in seed yields, nitrogen content of the seed increased, and oil content decreased. In 1949, with adequate rainfall, moderate temperatures, and 30 to 40 days additional growing season, there was little to no response to added nitrogen. The number of nodules per plant on the untreated plots was larger than in 1947, and the largest application of ammonium nitrate resulted in only a 35% decrease in number of nodules. The yield of seed increased very little, and no change occurred in the nitrogen and oil contents of the seed.

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THE EFFECTS OF THE CALCIUM-MAGNESIUM RATION ON THE SOLUBILITY AND AVAILABILITY OF PLANT NUTRIENTS

By J. Sanik, Jr., A. T. Perkins, and W. G. Schrenk Soil Sci. Soc. Amer. Proc., Vol. 16, No. 3, pp. 263-267. July 1952.

The purpose of the study was to determine the effect of the Ca-Mg ratio in solution and in the soil on the solubility and availability of certain plant nutrients.

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INFLUENCE OF DOUBLE-CUT PLOW MULCH TILLAGE ON NUMBER AND ACTIVITY OF MICROORGANISMS.

By S. J. R. Gamble, T. W. Edminster and Fred S. Orcutt; Soil Sci. Soc. Amer. Proc., Vol. 16, No. 3, pp. 267-269. July 1952.

A decreased availability of plant food throughout the growing season has been observed for some stubble mulch practices. To determine if the microflora were involved as a possible factor in this plant food availability difference, comparative data were obtained from double-cut and turnplow soil samples. The following microbiological factors may be related to the plant food tie-up problems: (a) The environmental conditions of better oxygen supply and more organic matter in the 0-6 inch horizon seem to favor the stimulation of the soil fungi in the mulch plots. This group of soil microorganisms might cause a temporary loss of nitrate-nitrogen as a result of protein synthesis by the mold cells. (b) Biochemical nitrification showed slightly lower amounts of nitrate-nitrogen formed from the mulch than from the turnplow samples. In addition, the soil pH should be considered as an environmental factor which may have considerable influence on the activity of the soil population. It is believed that these factors might be temporarily involved in the plant food tieup problems found to be associated with stubble mulch tillage practices.

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USE OF SOIL SURVEY INFORMATION FOR TAX ASSESSMENT IN TAYLOR COUNTY, IOWA.

By W. H. Scholtes and F. F. Riecken; Soil Sci. Soc. Amer. Proc., Vol. 16, No. 3, pp. 270-273, July 1952.

A detailed soil survey was utilized by the county assessor in Taylor County, Iowa for reassessment of rural land in 1949. Detailed information was provided on the soils and their relative productivity ratings according to their suitability for the production of corn. Dollar values were established by the assessor for the different corn suitability ratings. The values of the tracts for assessment were then simply obtained by adding the measured acreage of each soil in the tract times its dollar valuation, minus certain deductions for such factors as waste.

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FURTHER TRIALS WITH INTERCROPPING OF CORN IN ESTABLISHED SODS.

By Touby Kurtz, S. W. Melsted, R. H. Bray and H. L. Breland; Soil Sci. Soc. Amer. Proc., Vol. 16, No. 3, pp 282-285. July 1952.

This paper reports a continuation of trials in which corn is grown in cultivated slits in previously established sods of several single grasses and legumes. An attempt was made to estimate the nitrogen needs of the corn under different intercrops and to determine which intercrops were most adaptable and desirable in this system. Some data on soil moisture under the different systems are reported.

With adequate nitrogen, yields of corn in intercrops varied from around 80% of, to approximately the same as, the yields obtained under conventional systems. Among the legumes, Ladino clover and birdsfoot trefoil survived longest as intercrops. While all intercrops competed strongly with the corn for nitrogen, competition by the grasses was most severe and little difference was shown among the grasses with respect to survival and adaptability. Changes in soil mositure were more rapid under intercrop systems because of deeper and more rapid penetration of rainfall and because of utilization of moisture by the intercrop.

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FIELD MEASUREMENTS FOR TESTS OF SOIL DRAINAGE THEORY.

By D. Kirkham and J. W. de Zeeuw; Soil Sci. Soc. Amer. Proc., Vol. 16, No. 3, pp. 286-293. July 1952.

Measurements are reported for water table heights rainfall, permeability, and in some cases, of ditch and drain tile outflow, for tile drains and ditch drains in replicated plots in the recently reclaimed North East Polder, the Netherlands. The spacing of the ditches and tiles is 8, 10, 12, and 16 meters, the nominal depth of tiles 1 meter, of ditches 60 cm. The measurements were made in November and December 1950, when evaporation and transpiration effects were small, and are believed to be the most extensive measurements yet made for testing modern drainage theory under field conditions. An order of magnitude theroretical test of the data appears satisfactory. From an immediately practical view point it was found that tiles, apparently because of their greater depth, kept the water table lower at all times than the ditches. Tiles at 50-foot(16 meter) spacing kept the water table 1/2 foot below the soil surface; tiles at 25-foot spacing kept the water table 2 feet below the soil surface. For ditches at the same spacings the values were 1/4 foot and 1 foot 3 inches.

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NITROGEN RECOVERIES FROM APPLICATIONS OF AMMONIUM CHLORIDE, PHOSPHATE, AND SULFATE AND OUTGO OF COMPLEMENTARY IONS IN RAINWATER LEACHINGS THROUGH A SIX-FOOT SOIL-SUBSOIL COLUMN.

By W. H. MacIntire, J. B. Young, W. M. Shaw and B. Robinson; Soil Sci. Soc. Amer. Proc., Vol. 16, No. 3, pp. 301-306. July 1952.

The objectives of the 12-year lysimeter study were to determine (a) annual recoveries of nitrogen as $NH_3$, $NO_2$, and $NO_3$ from ammonium chloride, phosphate, and sulfate applications to a 1-foot stratum of Cumberland silt loam underlain by a 5-foot column of red clay subsoil, and (b) attendant outgo of exchanged Ca, Mg, and K and recoveries of additive Cl and $SO_4$.

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A SOIL PRODUCTIVITY SCORE CARD.

By K. C. Berger, F. D. Hole, and J. M. Beardsley Soil Sci. Soc. Amer. Proc., Vol. 16, No. 3, pp. 307-311. July 1952.

A soil productivity score card has been designed so that any careful agricultural worker can obtain reasonably reliable ratings for individual fields and farms in Wisconsin. The only tools required are a soil sampling tool, leveling device to approximate slopes in percent, sampling bags, and the Soil Productivity Score Card.

The ratings indicate relative current capacities of fields to produce crops, and are adjusted to a possible high score of 100, the sum of 11 optimum figures which include 10 ratings for soil and land characteristics and one for length of frost-free season. The score card offers a choice of four ratings - low to high- for each characteristic. The user of the card is not asked to recognize and map the soil types. Rather, he rates soils by fields. Soil samples are taken from each field for pH, and available phosphorus and potassium quick tests. A total farm score may be derived from the field ratings. A comparison shows substantial agreement between the following three methods of evaluation: Testing on a variety of soils in Wisconsin whose results have been compared with the U.S. Soil Conservation Service land use capability classification of the same fields, and with soil survey productivity ratings. On farms which are without any soil map, the score card helps to provide essential information for the guidance of workers in farm planning and rental programs. Admittedly, there are certain inherent defects in a rating scheme of this kind, such as interdependence of soil factors and differential productivity of a given soil for different crops.

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A KEY FOR EVALUATING SOIL PERMEABILITY BY MEANS OF CERTAIN FIELD CLUES.

By Alfred M. O'Neal; Soil Sci. Soc. Amer. Proc., Vol. 16, No. 3, pp. 312-315. July 1952.

Field clues to soil permeability were investigated at 182 locations from 1947 through 1951. Estimates of permeability were made in the field without prior knowledge of measured percolation rates. Then the estimated permeability class was compared with the measured rate. In case of

discrepancy, the profile was re-examined to see if any significant clues had been overlooked. It was found that permeability could be estimated, with fair precision, from information obtained in the field, in terms of seven classes that are defined in terms of saturated percolation rates.

The first step is determination of the type of structure. Then the class of permeability is estimated from four principal clues and one or more of eight secondary clues. Types of structure and structureless conditions found significant are fragmental, platy, nuciform, cubical blocky, prismatic, single grain, and massive. Principal clues are relative dimensions horizontally and vertically, of structural aggregates; amount and direction of overlap of the aggregates; number of visible pores; and texture. Important secondary clues are compaction, direction of natural breakage, silt content, cementation, type of clay minerals, character of coatings on aggregates, degree of mottling and certain features of climate. None of these clues when taken singly, is a reliable indicator of permeability, but each must be considered with reference to the other.

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SOIL BUILDER OR DESTROYER?

By S. W. Melsted; What's New in Crops and Soils, Vol. 5, No. 4, pp. 7-9. Jan. 1953.

The author expresses the belief that the productivity can be maintained and even built up under continuous corn culture provided suitable modifications be made in present cultural practices. Soil productivity, as used here, means the capacity of a soil to produce a crop. In order to accomplish this objective the present exploitive practice of growing corn which encourages soil erosion, the depletion of soil organic matter, and leads to decreased yields must be replaced by constructive soil building practices.

The author finds nothing inherent in the corn plant that makes it "hard" on the soil. The lack of adequate fertilization and the excess cultivation practices leading to larger erosion losses are responsible for the deleterious action of corn on soils. When properly managed and adequately fertilized, the corn crop may well be the farmer's most profitable soil building crop.

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HERBICIDES--NEW TOOL IN COTTON GROWING.

By D. A. Hinkle; What's New in Crops & Soils, Vol. 5, No. 4, pp. 12-13. Jan. 1953.

The use of chemicals promises the elimination of chopping and hoeing cotton and permits of complete mechanization of cotton production from planting to harvest.

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ANHYDROUS AMMONIA BOOSTS CROP YIELDS.

By Edwin C. Seim; What's New in Crops and Soils, Vol. 5, No. 4, pp. 14-15. Jan. 1953.

This paper explains and illustrates how the use of anhydrous ammonia increases corn yields.

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ORGANIC MATTER KEEPS YOUR SOIL PRODUCTIVE!

By Roger A. Bray; What's New in Crops and Soils, Vol. 5, No. 2, pp. 20-23, Nov. 1952

This paper discusses the importance of organic matter in a soil fertility program. A good organic matter program is one which gives maximum yields of all crops being grown by duilding up the supply of nutrients, including nitrogen, to the level required for maximum yields then maintaining that level. It is one where green manure crops, high in nitrogen, and crop residues are plowed down to recreate the humus decomposed each year. Above all, it is one where the nitrogen value is at least slightly on the positive side so that the organic matter goes to build humus.

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MORE CORN ON FEWER ACRES IN THE SOUTH.

By D. A. Hinkle; What's New in Crops & Soils, Vol. 5, No. 2, pp. 14-17, November 1952.

This article states that with proper fertilization and adequate stands the yield of corn can be increased substantially in the south.

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AN OLD PRACTICE AND A NEW IDEA.

By Jerry Eastin; What's New in Crops & Soils, Vol. 5, No. 3, pp. 14-15, Dec. 1952

This paper shows how crop yields may be increased by the practice of sub-surface tillage.

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THE USE OF METHYL BROMIDE AND CHLORDANE FOR THE CONTROL OF THE TEXAS LEAF-CUTTING ANT.

By D. A. Anderson; Texas Forest Service (College Station, Tex.) Research Note No. 1. July 24,1952.

The purpose of this study was to determine the effect of December and January treatments of several concentrations of methyl bromide and chlordane in controlling Texas leaf-cutting ants in colonies of various sizes. Methyl bromide was more effective than chlordane in the control of the leaf-cutting ants. December and January treatments with this chemical were about equally effective.

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SOME PLANT-SOIL-WATER RELATIONS IN WATERSHED MANAGEMENT.

By Leon Lassen, Howard W. Lull, and Bernard Frank; USDA Cir. No. 910. Oct. 1952.

This publication attempts to bring together the available technical knowledge of the more important natural principles which appear to govern the interrelations of plants, soil, and water. It also provides a means for appraising the effects of given land conditions, treatments, and uses on stream-flow behavior.

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NUTRITIVE VALUE OF BROUSE ON MONTANA WINTER RANGES.

By Donald A. Jameson; Jour. of Range Mgt., Vol. 5, No. 5, pp. 306-310, Sept. 1952.

Winterfat, greasewood, and shadscale were important as winter feed sources, whereas big sagebrush had very little value. Abundant, palatable brouse plants on winter ranges should provide some nutrients which are deficient in range grasses during the winter months. The palatable shrubs had some value as sources of protein and carotene, but were not valuable as a phosphorus source.

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NUTRITIVE VALUE OF CHEATGRASS AND CRESTED WHEATGRASS ON SPRING RANGES IN UTAH.

By C. Wayne Cook and Lorin E. Harris; Jour. of Range Mgt., Vol. 5, No. 5, pp. 331-337. Sept.1952

The nutrient content of the more desirable constituents and digestibility of the material consumed by sheep showed definite downward trends for cheatgrass with advance stages of growth. However, greater selectivity for the more tender parts of the crested wheatgrass plant prevented a definite trend with increased maturity.

Cheatgrass was considered deficient in digestible protein during the latter part of the grazing season but furnished a balanced ration in other respects. Crested wheatgrass furnished considerably more digestible protein than cheatgrass throughout the spring season and was considered a satisfactory ration for lactating ewes.

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COMPETITION BETWEEN GRASSES RESEEDED ON BURNED BRUSHLANDS IN CALIFORNIA.

By A. M. Schultz and H. H. Biswell; Jour. of Range Mgt. Vol. 5, No. 5, pp. 338-345. Sept.1952.

The study was conducted for the purpose of measuring the competition between domestic ryegrass and harding grass, tall fescue and milo. This paper reports the results of the first year after planting. It appears that the establishment of a good stand of harding grass, tall fescue or milo depends much more on rate of seeding of a competing annual grass such as rye grass than on the rate of seeding of the perennial itself.

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VARIATIONS IN CHEMICAL COMPOSITION OF BLUEBUSH, WHEATGRASS, ARROWLEAF BALSAMROOT, AND ASSOCIATED RANGE PLANTS.

By James P. Blaisdell, A. C. Wiese, and C. W. Hodgson; Jour. of Range Mgt., Vol. 5, No. 5, pp. 346-353. Sept. 1952.

Chemical composition of bluebush wheatgrass, arrowleaf balsamroot, and associate species was studied on sagebrush grass range on the Upper Smoke River Plains. As wheatgrass and balsamroot matured, the percentage of crude protein and phosphorus decreased rapidly, whereas that of nitrogen-free extract and crude fiber increased. The percentage of crude fat in the wheatgrass remained about constant, but in balsamroot it decreased markedly with maturity. The proportion of calcium also remained fairly constant in wheatgrass but increased considerably in balsamroot. The low content of protein and phosphorus and the wide calcium-phosphorus ratio were the most striking features of the fall herbage collections.

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CHEMICAL CONTROL OF BIG SAGEBRUSH IN WYOMING.

By A. C. Hull, Jr., N. A. Kissinger, Jr., and W. T. Vaughn; Jour. of Range Mgt., Vol. 5, No.6, p. 398. Nov. 1952.

Studies indicate that 75 percent and higher kills of big sagebrush can be obtained with as little as 1 pound per acre of 2,4,5-T ester or 2 pounds per acre of 2,4-D ester. These herbicides were most effective when applied in 3 to 5 gallons of diesel oil carrier about the time the native bluegrass started blooming. Treatments which gave good control of big sagebrush did not result in severe damage to other shrub species or herbaceous vegetation.

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STORING RAINFALL AT THE GRASS ROOTS.

By Ben Osborn; Jour. of Range Mgt., Vol.5, No.6, pp. 408-414. Nov. 1952.

The potential capacity of range lands to absorb and store rain water in most ordinary soils is indicated by results of standardized tests on small field plots with a mobile raindrop applicator. These studies showed that every deep soil studied, regardless of texture, was capable in its optimum conditions of holding with little or no runoff the first 2 inches of water applied, at intensities up to 50 year frequency.

The conditions of cover and soil which may change on the same site with time, and which are related to range condition classes, greatly influence the ability of the land to absorb the rain as it falls. Adequate surface cover to cushion the impact of the falling raindrops and favorable soil conditions associated with a relatively advanced stage of ecological succession for the site, typical of one of the range condition classes are essential for maximum intake of water.

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LONGEVITY OF RIPPED FURROWS IN SOUTHERN ARIZONA DESERT GRASSLAND.

By Albert L. Brown and A. C. Everson; Jour. of Range Mgt., Vol. 5, No. 6, pp. 415-419. Nov.1952.

That ripped furrows on desert grassland are still operative after more than 10 years is indicated by the high forage production of the furrows in comparison with the non-ripped land. This high forage production and the present condition of the furrow lend to the belief that these furrows will probably remain active for about five years more.

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AN ANALYSIS OF BRANCHING FLOW IN PIPES.

By Robert A. Aldrich and Albert Molenaar; Agr. Engin., Vol. 33, No. 12, pp. 780-781, +783. Dec. 1952.

This paper presents an analysis of the problem of outward-branching flow applied to a single branch of pipe.

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FACTORS IN THE IMPROVEMENT OF PASTURES.

By Edward A. Silver; Agr. Eng., Vol. 33, No. 12, pp. 796-797, +799. Dec. 1952.

Pasture maintenance involves the promotion and maintenance of an already established pasture with a healthy growth of plants through proper management of grazing practices, fertilization, liming and other required soil and grass treatments. Maintenance of the proper nutrient balance, liming and grazing management are probably the three most important steps toward the maintenance of a good pasture.

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THE PERFORMANCE OF SIX GRASSES GROWING ALONE AND IN COMBINATION WITH LEGUMES WITH DIFFERENTIAL NITROGEN AND PHOSPHATE FERTILIZATION IN A YAKIMA VALLEY PASTURE.

By J. A. Jacobs; Agron.Jour., Vol. 44, No. 11, pp. 573-578. Nov. 1952.

The object of this experiment was to determine the influence of two legumes, six grasses, and nitrogen and phosphate fertilization on the forage production of an irrigated pasture in the Yakima Valley.

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EFFECTS OF DIFFERENTIAL CLIPPING ON GROWTH AND DEVELOPMENT OF SEEDLING GRASSES AND LEGUMES.

By R. E. Wagner; Agron. Jour., Vol. 44, No. 11, pp. 578-584. Nov. 1952.

Studies were conducted in the greenhouse concerning the seedling growth and development of four species of grasses and legumes seeded alone and in mixtures and the influence of various cutting treatments on top and root development, survival and production. In general, seedling plants of orchard grass developed more rapidly than those of brome grass, Ladino clover, or alfalfa. Brome grass tended to be intermediate whereas Ladino clover and alfalfa were slowest in development. However, when the plants were not defoliated, the subterranean growth of brome grass was usually just as great as the root growth of orchard grass.

Greatest percentage increases from day to day in root and top weights of plants occurred during early stages of development, whereas the greatest total increase in dry matter production was found during the period the plants increased in age from 90 to 130 days. Percentage increases between 90 and 130 days were in most cases greater in root growth than in top growth.

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EFFECT OF MCP ON NUTGRASS.

By C. Thacker; Agron. Jour., Vol. 44, No. 11, pp. 589-590. Nov. 1952.

It took about 15 days to kill the top growth of weed plants in plots treated with 0.5 percent, 12 days with 1 percent, 10 days with 2 percent, 8-9 days with 2.5 percent, and about a week with 3 percent dosage. Tubers from the affected fields failed to sprout along with unaffected ones when replanted in a separate place. Cane-sets when planted in the untreated and treated plots showed no difference in sprouting.

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COASTAL BERMUDA GRASS ON CONSERVATION FARMS.

By W. W. Hull; Jour. Soil & Water Conserv., Vol. 7, No. 5, p. 222, Nov. 1952.

This paper describes coastal Bermuda grass and discusses its use as a soil conserving crop.

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WILDLIFE AND THE BUSINESS OF FARMING.

By Durword L. Allen; Jour. Soil & Water Conserv. Vol. 7, No. 5, 223-226, +245. Nov. 1952.

There is a growing appreciation for wildlife as a part of our American standard of living. Esthetic and recreational benefits increase steadily in volume as the population increases and the land use becomes more intensive. By virtue of their fertile soils, agricultural lands have a high potential yield of useful creatures, and they are accessible to large numbers of people.

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THE STORY OF TWO WATERSHEDS.

By John A. Allis; Jour. Soil & Water Conserv., Vol. 7, No. 5, pp. 243-245. Nov. 1952.

The tragic floods on the Kansas River in July, 1951, which have been called the Nation's worst to date, are a challenge not only to engineers but to the farmers. The farmers can control to some extent the water which contributes to floods This was shown by a group of five farmers of an upper watershed of the 60,000 square mile river basin. What was measured there concerns the effects of conservation on tributary stream flow.

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A PRELIMINARY REPORT ON PRESCRIBED BURNING IN VIRGIN PONDEROSA PINE.

By Harold Weaver; Jour. of Forestry, Vol. 50, No. 9, pp. 662-667. Sept. 1952.

Large-scale prescribed burning operations conducted in virgin ponderosa pine stands have produced results of sufficient significance to warrant a discussion and considerable future study. Reduction in fire hazard has been of particular significance. On the prescribed burn areas numerous hot, damaging wild fires, started almost entirely by lightning, burned over many hundreds of acres during the last three fire seasons previous to the treatment. In contrast during the 1951 fire season of almost unprecedented hazard and danger, following treatment, it was necessary to control only eight light fires that burned a total area of 4 acres. Significant harmful results, such as accelerated soil erosion, have not been observed.

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THINNING YELLOW-POPLAR IN SECOND-GROWTH UPLAND HARDWOOD STANDS.

By W. G. Wahlenberg; Jour. of Forestry, Vol. 50, No. 9, pp. 671-675. Sept. 1952.

Ten years of records of growth of individual trees and stands are presented here for the high and low thinnings of two intensities in 30-year old stands of yellow-poplar and associated species. Conclusions drawn at this time apply only to cordwood production and may be subject to different interpretation later when board-foot volumes can be measured and evaluated.

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COMMUNITY FOREST PATTERNS AND OBJECTIVES.

By Fred B. Trenk; Jour. of Forestry, Vol. 50, No. 10 pp. 739-742. Oct. 1952.

The community forest is the Nation's oldest type of public forest. Continuous records of management and income dating to Colonial days attest to the premise a public forest need not be large to be permanent or productive.

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AN ANALYSIS OF INVESTMENTS IN PRUNING.

By Elmer W. Shaw and George R. Stabler; Jour. of Forestry, Vol. 50, No. 11, pp. 819-823. Nov.1952.

Artificial forest pruning is essential in young stands if clear, high-grade wood is to be produced in a reasonable length of time. The approximate cost of producing clear wood by pruning can be calculated in advance by a careful analysis of the factors involved. Likewise, if a future difference in volume between clear wood and knotty wood is assumed, the profit or loss on the pruning investment can also be predicted. The most important factory in determining the final profit is generally the average rate of diameter growth of the pruned section.

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COST ACCOUNTING IN TVA FOREST NURSERIES.

By Conro L. Olive, Jr. and Charles B. Umland; Jour. of Forestry, Vol. 50, No. 11, pp. 831-833. Nov. 1952.

This paper describes the cost accounting system used in TVA forest nurseries.

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AN ANSWER TO FOREST FIRE PREVENTION AND CONTROL IN ANTHRACITE COAL FIELDS.

By Samuel S. Cobb; Jour. of Forestry, Vol. 50, No. 11, pp. 834-837. Nov. 1952.

This paper describes a system of forest fire prevention which has proved effectual in anthracite coal fields.

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MECHANICAL PREPARATION OF SEEDBEDS FOR CONVERTING OAK-PINE STANDS TO PINE.

By S. Little and E. B. Moore; Jour. of Forestry, Vol. 50, No. 11, pp. 840-844. Nov. 1952.

Results of this study indicate that machines can be used in preparing seedbeds for pine reforestration but that good results can be expected only when a fair or better supply of seed will fall on the area within the next year.

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EFFECT OF SOIL FERTILITY ON THE PHYSICAL AND CHEMICAL PROPERTIES OF TREE SEED.

By C. T. Youngberg; Jour of Forestry, Vol. 50, No. 11, pp. 850-852, Nov. 1952.

The purpose of this study was to determine the effect of soil fertility on the composition of seed. The results indicate that it is advisable to avoid infertile soils when choosing sites for the establishment of seed "orchards" or plantations.

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NEW TRENDS IN STANDARDS OF RANGE USE.

By Kenneth W. Parker; Jour. of Forestry, Vol. 50, No. 11, pp. 856-859. Nov. 1952.

Utilization, condition, and range trend are treated as separate factors in arriving at standards of range use.

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EFFECT OF MOISTURE SUPPLY AND SOIL TEXTURE ON THE GROWTH OF SWEETGUM AND PINE SEEDLINGS.

By Karl F. Wenger; Jour of Forestry, Vol. 50, No. 11, pp. 862-864. Nov. 1952.

Potted 1-year-old seedlings of three species - loblolly pine, shortleaf pine, and sweetgum - were grown inthe greenhouse through one growing season in soils of three different textures under three levels of watering. Loblolly and shortleaf pine did not differ significantly in any respect and were compared with sweetgum together. Pine exceeded sweetgum in growth in length under all conditions and sweetgum exceeded pine in fresh weight increase, and dry weight root-top ratio. Sweetgum growth differed significantly by both soil and watering while pine differed only by watering. Sweetgum therefore seemed to be more sensitive than pine to soil texture differences.

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UPTAKE BY PLANTS OF LABELLED PHOSPHATES FROM NEUTRON-IRRADIATED CALCIUM PHOSPHATES. I. UPTAKE BY SEEDLINGS FROM SOLUTION-CULTURES. II. UPTAKE OF SEEDLINGS FROM SOIL-SOD CULTURES.

By J.G.A. Fiskell, W. A. DeLong and W. F. Oliver; Sci. Agr., Vol. 32, No. 9, pp. 474-483. Sept.1952

Evidence is presented indicating seedling plants of barley, oats, and rye absorb the orthophosphate form of phosphorus-32 preferentially from sand cultures containing neutron-irradiated calcium phosphates and that the ratio, percent uptake of phosphorus-31 to percent uptake of phosphorus-32,is not constant. Seedling technique was used to evaluate the uptake of soil and fertilizer phosphorus from four soils treated with three neutron-irradiated calcium phosphates.

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AVAILABILITY OF FERTILIZER AND SOIL PHOSPHORUS TO GRAIN CROPS AND THE EFFECT OF PLACEMENT AND RATE OF APPLICATION ON PHOSPHORUS UPTAKE.

By J. Mitchell, A. M. Kristjanson, H. G. Dion, and J.W.T. Spinks; Sci. Agr., Vol. 32, No. 10, pp. 511-525. Oct. 1952.

$P^{32}$ labelled fertilizers were used to determine the availability of phosphorus fertilizers of analysis 0-20-0 to small grain. The effect of varying the rate of application of 11-48-0 from 0-96 pounds P205 per acre on the uptake of fertilizer by wheat plants was investigated. The 11-48-0 gave the largest uptake of fertilizer. The uptake was at a maximum when granulated fertilizer was placed at 3 inches and the seed 3 inches deep. Experiments on radiation effects are also reported.

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THE NATURE OF CLAY MINERALS IN SOME SASKATCHEWAN SOILS.

By F. G. Wardler and H. G. Dion; Sci. Agr., Vol. 32, No. 10, pp. 535-547. Oct. 1952.

The clay fraction of the $< 0.001$ mm. effective diameter was separated from the horizons of several soil profiles, representing soils from different soil zones and soil associations. Kaolinite was absent and the clay minerals present were of 2:1 layer lattice type. About 45% of the clay fraction was illite and the remainder was montmorillonite-beidellite. All profiles studied and all samples within the profiles were similar in clay mineral composition and the weathering conditions and type of vegetation represented produced no significant differences in the resulting clay minerals. The mineralogical nature of the clay fractions were similar to that of the parent material.

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RESPONSE OF BROME GRASS TO NITROGEN FERTILIZERS.

By R. P. Knowles and D. A. Cooke; Sci. Agr., Vol. 32, No. 10, pp. 548-554. Oct. 1952.

Results are reported of preliminary tests of nitrogen fertilizers on brome grass in two districts of Saskatchewan. Moisture conditions and time of fertilizer application are important factors in the recommendation of nitrogen fertilizers for grass in that region.

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EFFECT OF CROPPING SYSTEMS ON THE AGGREGATION OF A BROOKSTON CLAY SOIL AT THREE DEPTHS.

By E. F. Bolton and L. B. Webber; Sci. Agr., Vol. 32, No. 10, pp. 555-558. Oct. 1952.

The purpose of this study was to determine the effects of certain cropping systems upon aggregation and different depths on Brookston clay. Results at the 0-4 inch depth were markedly influenced by the cropping system. The crops may be arranged in a decreasing order of aggregating effect: bluegrass sod> alfalfa-brome(second year)> alfalfa-brome(first year)> oats> continous corn. Those crops that tended to add organic matter had a favorable effect on aggregation.

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PERSISTENCE OF AMMONIUM ION AND ITS EFFECTS UPON PHYSICAL AND CHEMICAL PROPERTIES OF SOIL.

By R. L. Fox, R. A. Olson and A. P. Mazurak; Agron. Jour., Vol. 44, No. 10, pp. 509-513.Oct. 1952.

This paper reports the results of a study conducted of the persistence of the ammonium ion in soil and the effect of this ion upon certain soil properties. Ammonium nitrate fertilizer was broadcast on the surface of an eroded Sharpsburg soil. This soil was acid, low in organic matter and available phosphorus, and high in clay.

$NH_4$+ nitrogen applied in early November was almost completely recovered in the surface one-half inch on April 1. Appreciable amounts of $NH_4$+ remained in the surface one-half inch after two additional months. The long persistence of the ammonium ion at the surface of the soil caused a deflocculated condition which resulted in a crusting of the surface soil. This effect was evident even at a low (20 pounds per acre) application rate of $NH_4$+ nitrogen.

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CULTURAL METHODS OF ESTABLISHING GRASS WITH SWEETCLOVER AND THE EFFECT OF VARYING THE PERCENTAGE OF GRASS AND SWEETCLOVER ON THE CROP YIELD.

By Felix M. Entenmann, John L. Schwendiman, and J. K. Patterson; Agron. Jour., Vol. 44, No. 10, pp. 514-516. Oct. 1952.

Alternate row seedings of grass and sweetclover offer a practical method of controlling the amount of grass in the mixture. This is important as a means of obtaining the desired proportion of each species in the mixture.

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STUDIES ON PALATABILITY OF SOME TROPICAL LEGUMES

By H. E. Warmke, R. H. Freyre, and M. P. Morris; Agron. Jour., Vol. 44, No. 10, pp. 517-520. Oct. 1952.

Tests of relative palatability were made on a group of 11 tropical legume species, using the pasture cafeteria method with dairy cattle as the test animals. Observations were made during three separate rounds of grazing.

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SUGAR BEET RESPONSE TO MALEIC HYDRAZIDE TREATMENT.

By D. S. Mikkelsen, R. B. Griffith and D. Ririe; Agron. Jour., Vol. 44, No. 10, pp. 533-536. Oct. 1952.

A study was made of the effects of foliar maleic hydrazide treatment on sugar beets grown under conditions conducive to extreme vegetative growth and late maturity. Alterations in normal physiology and morphology were induced in immature and highly vegetative sugar beets. The top/root ratio of sugar beets, which generally increases during the maturation period, was accentuated by foliar growth regulator treatments

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REACTIONS BETWEEN TRACE ELEMENT SALTS AND N-P-K CARRIERS IN FERTILIZERS.

By A. A. Nikitin and Josephine W. Rainey; Agron. Jour., Vol. 44, No. 10, pp. 541-546. Oct. 1952.

The weak precipitating action of phosphate on trace elements does not interfere with their availability when used with N-P-K carriers in fertilizer. Superphosphate sorbed much smaller amounts of trace elements than nonacidforming N-P-K fertilizer.

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RUNOFF FROM PERMANENT PASTURES IN PENNSYLVANIA.

By R. R. Robinson and R. B. Alderfer; Agron.Jour. Vol. 44, No. 9, pp. 459-462. Sept. 1952.

This paper reports the results of a study of infiltration capacities on permanent pastures on various soil series in Pennsylvania.

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EFFECT OF NITROGEN FERTILIZATION ON THE CHEMICAL COMPOSITION OF BROMEGRASS.

By Virginia Carey, H. L. Mitchell and Kling Anderson; Agron. Jour., Vol. 44, No. 9, pp. 467-469. Sept. 1952.

The nitrogen content of bromegrass was increased progressively by fertilization with 0, 100, and 200 pounds of nitrogen per acre as ammonium nitrate. Application of 300 pounds of nitrogen produced little additional increase over a 200 pound application.

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THE SURVIVAL OF WINTER-HARDENED LEGUMES ENCASED IN ICE.

By Dale Smith; Agron. Jour., Vol. 44, No. 9, pp. 469-473. Sept. 1952.

The investigations reported in this paper were made to compare the survival of several cold-hardened legume species and strains when covered with ice for varying lengths of time in both the laboratory and the field.

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THE NUTRITION OF MUCK CROPS.

By Paul M. Harmer; Better Crops with Plant Food, Vol. 36, No. 8, pp. 6-11, +40, Oct. 1952 and Vol. 36, No. 9, pp. 6-12, +40, Nov. 1952.

The author discusses the plant nutrition problems encountered in the production of crops on muck soils in Michigan.

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THE MINERAL UPTAKE OF THE SWEET POTATO.

By L. E. Scott and W. L. Ogle; Better Crops with Plant Food, Vol. 36, No. 8, pp. 12-16, +50. Oct. 1952.

The sweet potato was found to require large amounts of potassium and relatively small amounts of phosphorus. The nitrogen uptake exceeded the amount supplied in the fertilization program. About half of the total uptake of nitrogen and potassium and two-thirds of the phosphorus were found in the harvested crop. Utilization of nitrogen and potassium were about equally divided between the first and last half of the growing season, although about 70 percent of the total growth, as measured by dry matter, takes place in the last half of the season.

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RESCUE--A PROFITABLE SEED CROP.

By Bill Nichols; Better Crops with Plant Food, Vol. 36, No. 8, pp. 17-18, +48, Oct. 1952.

In addition to its superior quality for grazing, rescue grass is also a heavy seed producer. Club boys produced 7,660 pounds of air-dried seed on a 4-acre plot at a total cost of $266.

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EVALUATION OF PHOSPHORIC ACID AND POTASH PROGRAMS.

By Myron A. Bachtell; Better Crops with Plant Food, Vol. 36, No. 8, pp, 19-22, 45-48. Oct.1952.

This paper describes a method of evaluating fertility systems by farmers in lieu of laboratory tests.

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BY-PRODUCTS OF RESEARCH

By Howard V. Jordan; Better Crops with Plant Food; Vol. 36, No. 8, pp. 23-25, +48-50. Oct. 1952.

This paper describes a high-fertility method of growing corn which results in the production of more corn with higher protein content and with fewer cultivations; at the same time, the return of crop residues was increased more than three-fold.

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SCIENCE AND THE COW LOOK AT PASTURE FORAGE AS A FEEDSTUFF: 3. SECURING MAXIMUM UTILIZATION FROM GRASSLANDS.

By Marshall E. McCullough; Better Crops with Plant Food, Vol. 36, No. 9, pp. 13-18, +41. Nov. 1952.

This paper discusses the proper utilization of forages available.

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DEFICIENCIES OF SECONDARY AND MICRO-NUTRIENT ELEMENTS IN PLANTS.

By J. E. McMurtrey, Jr.; Better Crops with Plant Food, Vol. 36, No. 9, pp. 19-26, +42. Nov. 1952.

This paper discusses the needs of secondary plant elements - calcium, sulphur, and magnesium; and the micro-elements - boron, copper, iron, manganese, molybdemum, zinc, in the production of tobacco.

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THE LEAF ANALYSIS APPROACH TO CROP NUTRITION.

By M. E. McCollam; Better Crops with Plant Food; Vol. 36, No. 10, pp. 6-14, +43. Dec. 1952.

This paper discusses the solution of the plant nutrition problems by means of analysis of portions of the plant.

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POTASH DEFICIENCY OF REFORESTED PINE AND SPRUCE STANDS IN NORTHERN NEW YORK.

By Svend O. Heiberg and Donald P. White; Better Crops with Plant Food, Vol. 36, No. 10, pp. 17-22 +46. Dec. 1952.

Serious nutrient deficiencies that may be encountered under certain ecological conditions in connection with the re-establishment of forests on old fields were investigated. It was demonstrated that these deficiencies could be corrected, at least in part, by applications of forest debris, forest humus, and potash fertilizers. In addition some light was thrown upon certain aspects of the nutrition of some tree species commonly used for reforestration.

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FLUE-CURED TOBACCO FERTILIZERS OF THE FUTURE.

By F. W. Parker; Better Crops with Plant Food, Vol. 36, No. 10, pp. 23-26, +40. Dec. 1952.

This paper lists three lines of research that should lead to major changes in fertilizers for flue-cured tobacco in the near future. These fertilizers will be better than the present standard grades, and the farmer's tobacco fertilizer bill will be substantially lower.

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IMPROVEMENTS IN IRRIGATION SYSTEMS.

By Justin M. Smith; The Improvement Era, Vol.55, No. 5, pp. 326-327. May 1952.

It is time downhill irrigation gives way to flat irrigation. The former method has served its purpose which was to provide crops the first few critical years until settlements became established. By switching to flat irrigation the damage from soil erosion and over-irrigation can be minimized, and the available water supply can be made to serve more land to produce more food for the growing population.

With modern machinery, fields can be leveled into flat benches at less cost than they can be leveled to a uniform sloping grade. Instead of leaving the sloping fields exposed to irrigated erosion, flat leveling effectively stops moving of soil by water.

Where irrigated land is not leveled and is too steep to level in benches, it should be planted to grass for permanent pasture and to hold the soil. As the slope becomes less, the step down from one bench to the next becomes less, until in the nearly flat bottoms of large valleys there is no difference; there are only the low dikes separating the various pans or borders. If each land surrounded by dikes is small, it is easily covered with water quickly. The larger the stream of water available, the larger the basins can be. They should be covered with water within about one-half hour. On slope-irrigated farms only from 25 to 40% of the water brought to the farms in the ditch can be used by crops. On flat, irrigated farms about 80% of the water is available for plant use.

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THE SUBSTITUTION OF CHEMICALS FOR TILLAGE IN PASTURE RENOVATION.

By M. A. Sprague; Agron. Jour., Vol. 44, No. 8, pp. 405-409. Aug. 1952.

This is a preliminary report based on 2 1/2 years results in developing new techniques for renovating nonplowable pastures in New Jersey. The study involves the use of chemical herbicides to prepare the soils for renovation and emphasizes the value of chemicals for reducing the tillage requirements in seedbed preparation and lessening competition to encourage seedling establishment.

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BORAX APPLICATIONS TO CANNING AND SUGAR BEETS FOR THE CONTROL OF WEEDS.

By J. C. Kandy, K. C. Berger and E. Truog; Agron. Jour., Vol. 44, No. 8, pp. 409-411. Aug. 1952.

This paper reports the results of tests conducted for the purpose of determining the effects of the application of borax at various rates ranging from 20 to 80 pounds per acre to sugar and canning beets on the control of weeds. Borax was applied either at each side and slightly below the seed or in a 4-inch band on the soil surface over the seed. The application of borax at the rate of 40 pounds per acre by either method was very effective as a weed control measure. The soil surface applications of borax over the seed generally gave better control for weeds in the row than the side-of-seed method of applications giving a decrease of as much as 65% in the numbers of weeds. Slight yield decreases resulted from the higher application rates (60, 70, and 80 pounds per acre). In no instance were the stands of beets affected by the rate or method of applying the borax. In most cases, the weeds remaining after 40 pounds of borax had been applied by either method were quite stunted and as a result, hand weeding was generally unnecessary.

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EFFECTS OF GRASS-LEGUME ASSOCIATIONS, ENVIRONMENT AND GENOTYPE ON CAROTENE AND NITROGEN CONTENT OF FORAGE CROPS.

By Ricardo Bressani and I. J. Johnson; Agron. Jour., Vol. 44, No. 8, pp. 414-420. Aug. 1952.

This paper reports the results of a study conducted to determine the relationships between carotene and nitrogen in two species of grasses and two species of legumes grown alone and in association, to measure genetic differences in carotene, chlorophyll and nitrogen content among non-inbred cions of bromegrass, and to determine the extent of loss in carotene during the curing process.

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A NEW ELECTRIC AUTOMATIC IRRIGATION SYSTEM.

By George J. Bouyoucos; Agron. Jour., Vol. 44, No. 8, pp. 448-451. Aug. 1952.

This paper describes an electric automatic irrigation system which will turn on and off the water automatically according to the need of the soil for water.

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NITROGEN UPTAKE BY WHEAT IN RELATION TO NITROGEN CONTENT OF SOIL.

By R. W. Carpenter, H. G. Haas, and E. F. Miles; Agron.Jour., Vol.44, No.8, pp. 420-423. Aug.1952

The purpose of this study was to determine the relationship between soil nitrogen and nitrogen availability under field conditions on soils of the same type. Uptake of nitrogen by wheat plants on low-nitrogen soils fell off rapidly after they had reached the heading stage, while uptake continued on the high-nitrogen soils. The quantities of nitrogen obtained from wheat clippings at joining, heading, and dough stages of growth were correlated with the nitrogen content of the top 6 inches of soil, and except at heading, with the 6- to 12-inch soil layer. High correlations were obtained between grain yields and the quantity of nitrogen in plants at all stages, with the amount in plants at jointing giving the best estimate of yield.

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ABSORPTION OF 2,4-D BY CORN AND PEA SEEDS.

By J. R. Hansen and K. P. Bucholtz; Agron.Jour., Vol. 44, No. 9, pp. 493-496. Sept. 1952.

The experimental results presented in this paper show the effect of pH on 2,4-D absorption by corn and pea seeds and the widely differing abilities between seeds of these two species to absorb 2,4-D from one solution.

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THE EFFECTIVENESS OF VARIOUS SOURCES OF NITROGEN IN THE PRODUCTION OF FLUE-CURED TOBACCO.

By Samuel L. Tisdale; Agron. Jour., Vol. 44, No. 9, pp. 496-499. Sept. 1952.

This paper presents a brief review of the existing literature on the effectiveness of various sources of nitrogen in the production of flue-cured tobacco as well as results of experiments recently conducted in North Carolina.

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STANDARD FERTILIZATION AND LIMING AS FACTORS IN MAINTAINING SOIL PRODUCTIVITY.

By Alfred Aslander; Soil Sci., Vol.74, No.3, pp. 181-195. Sept. 1952.

This paper presents a method of computing the amounts of plant nutrients that should be added to a given soil to produce maximal crop yields insofar as a lack of plant nutrients is the limiting factor of production. This method of fertilization is called standard fertilization because it is supposed to bring about a suitable nutritional standard in the soil. When standard fertilization has been tested in liming trials on acid soils, it has produced such heavy yields on unlimed plots that additions of lime has resulted in only small, if any, increases. Liming has become superfluous and unprofitable.

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RELATION OF COLLOIDAL HYDROUS OXIDES TO THE HIGH CATION-EXCHANGE CAPACITY OF SOME TROPICAL SOILS OF THE COOK ISLANDS.

By M. Fields, L. D. Swindale, and J. P. Richardson; Soil Sci., Vol.74, No.3, pp.197-205. Sept. 1952.

Evidence of X-ray diffraction, differential thermal analysis, exchange capacity estimations, and chemical analysis suggests that the cation-exchange capacity of some soils of the lower Cook Islands Group is due mainly to amorphous colloidal hydrous oxides.

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INFLUENCE OF THE HANDLING OF SUGAR CANE TRASH ON YIELDS AND SOIL PROPERTIES.

By G. Samuels, M. A. LugoLopez, and P.Landrau, Jr., Soil Sci. Vol. 74, No. 3, pp. 207-215. Sept. 1952.

Three methods of handling crop residues of sugar cane were compared. The residues were burned, buried and aligned in alternate banks or rows. No significant differences in yields of available 90° sugar in hundred-weights per acre were obtained for the first four ratoon crops. Significant differences in yields were obtained in the fifth and sixth ratoons. In the fifth ratoon the yield for the aligned-trash treatment was significantly higher at the 5 percent level than for the burned- and buried-trash treatments. For the sixth ratoon, the difference between the aligned-trash and the burned-trash increased to significance at the 1 percent level. There was no significant difference between yields for the burned- and buried-trash treatments.

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EFFECT OF CERTAIN CATIONS AND ANIONS ON PHOSPHORUS AVAILABILITY.

By G. C. Lewis, J. V. Jordan, and A. L. June; Soil Sci., Vol.74, No.3, pp.227-232. Sept.1952.

The purpose of this study was to investigate the influence of the carbonates, sulfates, and chlorides of calcium, magnesium and sodium in first, the availability of fertilizer $P_2O_5$ and second, the availability of soil $P_2O_5$.

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POTASSIUM, CALCIUM, AND MAGNESIUM IN TUNG LEAVES AS RELATED TO THESE IONS IN THE SOIL.

By Charles Nearpass and Matthew Drosdoff; Soil Sci., Vol.74, No.4, pp.295-300, Oct. 1952.

This paper reports the results of a field survey in which an attempt was made to correlate analyses to tung leaves with the exchangeable cations in the soil at the time the leaves were collected.

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CLAY MINERALS OF FOUR SOUTHERN NEW YORK SOILS.

By R. Torrence Martin and M. B. Russell, Soil Sci., Vol. 74, No. 4, pp. 267-279. Oct. 1952.

Fractionated clays from soils of a drainage catena of southern New York were examined by the techniques of differential thermal analysis, ethylene glycol retention, total potash content, cation-exchange capacity and X-ray methods. It is suggested that several properties be combined to give a mean index (y) which would be used to characterize soil clays. Such a treatment was applied to the data obtained.

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PLANT UTILIZATION OF ZINC NUTRIENTS IN HOUSTON BLACK CLAY.

By Robert J. Speer, Seward E. Allen, Margaret Maloney, and Ammarette Roberts; Soil Sci., Vol. 74, No. 4, pp. 291-293. Oct. 1952.

Zinc nitrate, zinc ammonium hydroxide and sodium zincate were shown to be readily available to crimson clover and rye grass grown on Houston black clay. These sources, though markedly different in chemical nature, were almost equally available to the index crops employed.

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POTASSIUM-SUPPLYING POWER OF EIGHT ALABAMA SOILS.

By R. W. Pearson; Soil Sci. Vol. 74, No. 4, pp. 301-309. October 1952.

This paper reports the results of a study of the transformations of potassium in certain agriculturally important soils in the southeastern United States in an effort to determine what properties of these soils influence their capacity to convert nonexchangeable potassium to forms readily absorbed by plants.

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MOVEMENT OF WATER IN SOIL DUE TO A TEMPERATURE GRADIENT.

By C. G. Curr, T. J. Marshall, and J. T. Hutton; Soil Sci., Vol. 74, No. 5, pp. 335-345. Nov.1952.

This paper attempts to assess the contribution of liquid and vapor flow to the temperature effect by measuring changes in the distribution of a small amount of soluble salt in the soil. It is assumed that movements of soluble salts are due to transport in the liquid phase only.

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RESPIRATION RATES AND PLATE COUNTS FOR DETERMINING EFFECT OF HERBICIDES ON HETEROTROPHIC SOIL MICROORGANISMS.

By S.J.R. Gamble, C. J. Mayhew, and W. E. Chappell Soil Sci., Vol. 74, No. 5, pp.347-350. Nov. 1952.

This paper reports the effect of herbicides on respiration rates and plate counts of soil microorganisms as determined in initial investigations of field plots that had previous herbicidal treatment. The results indicate that the herbicides studied reduced the respiration rate and plate counts of the saphrophytic microflow for 3 months after treatment.

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ELECTROCHEMICAL PROPERTIES OF HYDROGEN CLAYS FROM INDIAN BLACK COTTON SOILS.

By B. B. Roy and S. C. Das; Soil Sci., Vol. 74, No. 5, pp. 351-358. Nov. 1952.

The electrochemical and related properties of H-clays isolated from horizon samples of a typical black cotton soil profile from India were examined in detail with a view to gaining fuller information on the development and genesis of these soils with special reference to the nature and distribution of clay minerals with depth. Montmorillonite was found to be the predominant mineral. Illite was present to the extent of 20 to 35 percent. The electrochemical properties of the clays showed very little change with increasing depth.

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VARIATION IN SOIL BORON WITH CULTIVATION AND SEASON.

By Herbert W. Winsor; Soil Sci., Vol. 74, No.5, pp. 359- 364. Nov. 1952.

The effects of prolonged cultivation and diverse seasonal changes upon the amounts of boiling-water-extractable boron in certain Florida soils were studied. Cultivated soils were consistently lower in boron than virgin soils of the same type.

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EFFECT OF SULFUR FERTILIZATION ON THE VITAMIN CONTENT OF ALFALFA.

By J. W. Needham and S. M. Hague; Soil Sci., Vol. 74, No. 5, pp. 365-371. Nov. 1952.

The effect of sulfur treatments upon the vitamin B-complex of alfalfa were determined. Alfalfa grown on soil treated with 896 pounds of sulfur per acre failed to show any significant increase in the vitamin or sulfur content over that grown on soil which received no sulfur treatment.

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SOIL FERTILITY AND HUMAN NUTRITION.

By L. A. Maynard; Utah Agr. Expt. Sta. Farm & Home Sci., Vol. 13, No. 3, pp. 66-67. Sept. 1952.

This paper discusses the relationship of soil fertility to human nutrition and health.

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UTILIZATION OF PHOSPHORUS FROM BARLEY RESIDUES.

By W. H. Fuller and R. N. Rogers; Soil Sci.,Vol. 74, No. 5, pp. 373-382. Nov. 1952.

The utilization of phosphorus by rye grass from barley materials at three stages of maturity as compared with liquid acid when incorporated with some calcareous semiarid soils was studied. The availability of the phosphorus of the barley residues to rye grass appeared to be inversely related to the stage of maturity. Young and medium mature barley hay appeared to supply phosphorus to rye grass to about the same extent as did liquid $H_3Po_4$. The latter, however, appeared to be more available to rye grass than was mature barley straw and roots.

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CLAY MINERALS OF SOUTH AFRICA SOILS GROUPS: I. LATERITES AND RELATED SOILS.

By C. R. van der Merwe and H. Heystek; Soil Sci., Vol. 74, No. 5, pp. 383-401. Nov. 1952.

This paper reports the results of a study made of the mineralogical constitution of the colloids of South African lateritic soils. The study consisted of the application of X-ray diffraction and of differential thermal analysis. Under conditions of good drainage and high rainfall, a high degree of weathering takes place and the soil colloids consist only of kaolinite, gibbsite and iron oxide. When rainfall is below about 30 inches a year, weathering is less extensive, undecomposed quartz and mica tend to appear in the colloidal fraction, and the clay mineral is sometimes illite. Gibbsite, however, continues to appear.

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IT PAYS TO BUY GOOD DRAIN TILE.

By E. H. Kidder and W. A. Cutler, Mich. Agr. Ext. Serv. Folder F-166. Feb. 1952.

This paper discusses and illustrates the importance of selecting good drain tile. It stresses the importance of "crushing strength" and "denseness", the two principal factors in rating good drain tile. Some of the more common difficulties resulting from improper selection of drain tile are illustrated.

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THE EFFICIENCY OF DEPTH-INTEGRATING SUSPENDED-SEDIMENT SAMPLING.

By Ning Chien; Trans. Amer. Geophys. Union, Vol. 33, No. 5, pp. 693-698. Oct. 1952.

Because of the physical shape of the depth-integrating sampler, it is impossible to sample down to the bed. Only part of the total sediment load moving across the vertical will be caught by the sampler. Based on the suspended-load theory and bedload illustrated in graphical form, its significance and possible errors are pointed out.

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A METHOD OF APPROXIMATING THE WATER CONTENT OF SOILS.

By Nedavia Bethlahmy; Trans. Amer. Geophys. Union, Vol. 33, No. 5, pp. 699-706. Oct. 1952.

A procedure is described for calibrating fiberglass soil-moisture units, and for preparing the tables required to convert resistance readings into inches of water. The shape and slope of the calibration curves in the laboratory with the units placed in undisturbed soil samples. After the units have been placed in the field the laboratory curves are translated laterally along the moisture axis by an amount determined through simultaneous field moisture samples and resistance readings. Regression equations characterizing the bulk density of the soil (as a function of moisture content and depth) are taken into account in converting soil-moisture content from a percent dry-weight basis to inches of water. For thin horizons subject to large errors of measurement, a method is described for correcting the bulk-density regression equation so as to conform with its corresponding calibration curve.

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THE CIRCULATION OF LAKE MENDOTA.

By R. A. Bryson and V. E. Suomi; Trans. Amer. Geophys. Union, Vol. 33, No. 5, pp. 707-712. Oct. 1952.

The wind-driven circulation of two-layered lakes may be interpreted in terms of kinetic-energy production and horizontal divergence. Evidence from Lake Mendota, Wisconsin, indicates that the epilimnion is circulated directly by the wind, with some piling up of the water down-wind. This increased lake level results in depression of the thermocline, which in turn represents a solenoid concentration capable of circulating the hypolimnion.

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KNOW CALIFORNIA'S LAND--A LAND CAPABILITY GUIDE FOR SOIL AND WATER CONSERVATION.

By Leonard R. Wohletz and Edward F. Dolder; Calif. Dept. of Natural Resources & Soil Conservation Service. Feb. 1952.

This publication contains valuable information concerning California's land--the nature, distribution, extent, use and conservation of this basic natural resource. It is intended to help bring about the most beneficial use of the land in these days when we must have the maximum return from all available resources.

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INFLUENCE OF CAPILLARY CONDUCTIVITY AND DEPTH OF WETTING ON MOISTURE RETENTION IN SOIL.

By L. A. Richards and D. C. Moore; Trans. Amer. Geophys. Union, Vol. 33, No. 4, pp. 531-540. Aug. 1952.

The storage of moisture in soil in the field is discussed and explained in terms of the dynamic moisture-transmitting properties of the soil. Published data on capillary conductivity are summarized and additional new data for six soils are presented, along with a new pressure-type apparatus for measuring capillary conductivity.

After a deep permeable soil is wetted in the field, the moisture content soon reduces to a value referred to as field capacity which thereafter changes slowly with time. This field-capacity condition apparently corresponds to the moisture content and moisture tension at which the capillary conductivity of the soil becomes small. Changes thereafter depend on the hydraulic gradient and the low residual values for the conductivity. These, of course, depend on the moisture distribution in the whole profile.

A laboratory procedure sometimes used for estimating field capacity consists in measuring the moisture content of a mass of soil that has been wetted and allowed to stand a specified time in contact with dry soil. The dependence of this method on the depth of wetting is illustrated by laboratory tests on the three soils and the explanation for this dependence over a considerable range of moisture content below field capacity.

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FROST PENETRATION INTO SOILS AS INFLUENCED BY DEPTH OF SNOW, VEGETATIVE COVER, AND TEMPERATURE.

By Clyde E. Bay, George W. Wunnecke, and Orville E. Hays; Trans. Amer. Geophys. Union, Vol. 33, No. 4, pp. 541-546. Aug. 1952.

Frost penetration and removal in Miami silt loam and Almena silt loam were measured by resistance readings made on plaster of Paris blocks located at intervals in the soil profile to a 36-inch depth. As the soil water freezes, the unit resistance rises sharply.

Dense vegetative and snow cover insulate the soil and reduce the rate of soil freezing and thawing. Winter wheat gave very little protection to the soil. Graphs are included which show frost penetration and removal on hay, winter wheat, and plowed land on Miami silt loam. Eighteen inches of snow insulated the Almena soil sufficiently to prevent frost penetration to a depth of 12 inches when the weekly average daily minimum temperatures were as low as -13°F. Eighteen inches of snow did not prevent frost penetration when the average minimum temperature was -21°F. However, 24 inches of snow cover prevented frost penetration at -21°F. Graphs are included showing the frost movement into and out of the Almena soil under varying depths of snow cover. The soil thaws from both the surface and from the lower frost line.

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SOME FACTORS INVOLVED IN GROUND-WATER REPLENISHMENT.

By E. S. Bliss and C. E. Johnson; Trans. Amer. Geophys. Union, Vol. 33, No. 4, pp. 547-558. Aug. 1952.

Laboratory and field studies of water spreading on fine-textured soils are discussed. Effects of water-intake rates of treatments with cotton-gin trash, grasses, detergents, and other substances are interpreted in terms of fundamental processes. The effects of soil and water properties and changes in these properties as a result of various treatments are given consideration. Microbial activity and other causes of soil sealing are discussed. The results of microbial activity and a management program that ultimately leads to an increase in water-intake rates above normal are presented.

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MOISTURE FLOW TO A WELL OF CONSTANT DRAWDOWN IN AN EXTENSIVE AQUIFER.

By C. E. Jacob and S. W. Lohman; Trans. Amer. Geophys. Union, Vol. 33, No. 4, pp. 559-569. Aug. 1952.

A mathematical theory is given for the discharge of a well of constant drawdown, discharging as by natural flow from an effective infinite aquifer of uniform transmissibility and uniform compressibility. This theory is based on the solution by L. P. Smith of the analogous problem in heat conduction. The mathematical function involved in the solution, which cannot be integrated, is evaluated by numerical integration. A table of its values is given for a wide range of its argument. This function is compared with other asymptotic solutions, and simple useful approximations are given.

Two graphical methods are outlined for determining the coefficients of storage and transmissibility from variations in the rate of discharge of wells flowing at constant drawdown. Data from the Grand Junction, Colo., artesian basin are rated by these methods. In the Grand Junction, artesian basin there are about 35 flowing wells ranging in depth from 600 to 1,000 feet, most of which obtain water from the Entrada sandstone. A few of the wells obtain water from a sandstone in overlying Morrison formation and a few tap the underlying Wingate sandstone. The procedure of the tests outlined, and the "ink-well" mercury gage used to measure the artesian pressures is described. Recovery tests were run on the same wells

after the discharge tests. Values of transmissibility obtained from the recovery tests check those obtained by means of the discharge tests.

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EFFECTS OF IRRIGATION DROPLET SIZE ON INFILTRATION AND AGGREGATE BREAKDOWN.

By Gilbert Levine; Agr. Eng., Vol.33, No.9, pp. 559-560. Sept. 1952.

This paper describes some studies carried out to determine the effect of sprinkler irrigation on aggregate breakdown and infiltration capacity. The effect of the size of irrigation drops on soil structure was found to be an important factor when designing an irrigation system.

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A PHOTOGRAPHIC TECHNIQUE FOR MEASURING THE SIZES AND VELOCITIES OF WATER DROPS FROM IRRIGATION SPRINKLERS.

By Robert L. Green; Agr. Eng., Vol. 33, No. 9, pp. 563-564, 566,+568. Sept. 1952.

This paper discusses studies conducted for the purpose of developing techniques of adequately measuring the characteristics of irrigation sprinklers and the effects of various drop-size and velocity patterns on "standard" soils.

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CORRELATION OF MACHINERY AND CONSERVATION PRACTICES.

By John R. Carreker; Agr. Eng., Vol. 33, No. 10, pp. 623-624, +643. Oct. 1952.

This paper discusses the advances made in conservation farming and the use of mechanical equipment during recent years in the southeast.

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SOIL AND WATER MANAGEMENT UNDER THE COMPLETE WATERSHED PROGRAM.

By Howard Matson; Agr. Eng., Vol. 33, No. 10, pp. 625-626. Oct. 1952.

This paper discusses all phases of the conservation, use, and control of soil and water resources on a watershed basis.

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DETERMINING THE EFFECT OF TOPOGRAPHY AND DESIGN ON THE CHARACTERISTICS OF FARM PONDS.

By R. P. Beasley; Agr. Eng., Vol. 33, No. 11, pp. 702-704. Nov. 1952.

This paper presents a method by which the characteristics of farm ponds can be determined prior to construction. It determines the capacity of the pond, the amount of earth in the dam, the surface area, the area of maximum depth, the depth of water at all points, and the distance the earth must be moved in building the dam.

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DETERMINING TIME AND AMOUNT OF IRRIGATION.

By D. B. Krimgold; Agr. Eng., Vol. 33, No. 11, pp. 705-706, +707. Nov. 1952.

This paper presents a farmer's view of some irrigation problems.

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THE SMALL DAM PROGRAM IN FLOOD CONTROL.

By L. S. Terbush; Agr. Eng., Vol. 33, No. 11, p.716. Nov. 1952.

This paper discusses the use of small dams in a flood control program.

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A METHOD OF INCREASING THE LATITUDE OF A RECORDING POTENTIOMETER.

By C. M. Hansen and Carl W. Hall; Agr. Eng., Vol. 33, No. 11, p. 718. Nov. 1952.

This paper explains how an 8-point recording potentiometer is used for recording automatically the temperature of 52 individual thermocouples. A rotary stepping switch which by-passes the 8-point switch in the potentiometer makes the recording possible.

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SOIL MANAGEMENT IN A YOUNG MONTMORENCY SOUR CHERRY ORCHARD.

By H. K. Fleming and R. B. Alderfer; Penn. Agr. Expt. Sta. Bul. 557. Sept. 1952.

Six fertilizer treatments with cultivation and a winter cover crop, and two with ladino clover sod were compared from the sixth through the tenth year of a young Montmorency sour cherry orchard in the deep, well-drained Chenango gravelly sandy loam soil of Erie County. There was no difference in tree size which could be attributed to fertilizer treatment, either with the cultivated or within the sod portions of the orchard.

The rate of trunk circumference increase of trees in sod was appreciably lower than that of cultivated trees receiving the same fertilizer treatment for the first two years. Starting with the third year, trees in sod have grown as well as those under cultivation. Trees in ladino clover sod yielded as well as those under cultivation which received the same fertilizer applications.

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FLOOD PREVENTION.

By Carl B. Brown; paper presented at the meetings of The American Society of Agr. Engineers, Chicago, Ill., Dec. 15-17, 1952.

Flood prevention work is aimed at achieving the maximum practicable management of storm precipitation on the land where it falls and of storm runoff in the small branches and creeks of the upper watersheds--all essentially above alluvial flood-plain areas. This objective is to be achieved, first, by assisting in the application of land-treatment measures that are effective in increasing infiltration and the water-holding capacity of the soil reservoir. Secondly, by installing measures such as tributary channels to prevent overbank flow or flooding.

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THE MESQUITE PROBLEM ON SOUTHERN ARIZONA RANGES.

By Kenneth W. Parker and S. Clark Martin; USDA Cir. No. 908. Oct. 1952.

This circular reports the results of studies conducted for the purpose of determining how to eliminate mesquite and how to reclaim mesquite-infested grasslands. It is based on 10 years of detailed experimentation with mesquite, practical experience in its control, and observation of the effects of control.

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A PROGRESS REPORT ON A POTATO ROTATION EXPERIMENT AT ONLEY.

By E. M. Dunton, Jr.; Va. Truck Expt. Sta.; Vegetable Growers News, Vol. 7, No. 7, p. 1. Jan. 1, 1953.

Where no cover was grown and the land kept free of any plant growth after potatoes there was a lower yield of potatoes. Volunteer grass was about as effective as a cover as any of the cultivated crops grown.

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PROGRESS OF CHEMICAL WEED CONTROL IN STRAWBERRIES.

By L. L. Danielson; Va. Truck Expt. Sta.; Vegetable Growers News, Vol. 7, No. 7, p. 2. Jan. 1, 1953.

The use of a combination of Craig Herbicide No. 1 and 3-Chloro-IPC showed much better weed control than either chemical alone. Excellent weed control was obtained with the combination of these chemicals when the soil was moist enough for quick weed seed germination at the time of spraying as this combination of chemicals is a soil treatment applied before emergence of the weeds.

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EROSION UNDER FURROW IRRIGATION.

By N. A. Evans and M. E. Jensen; N. Dak. Agr. Expt. Sta. Bimonthly Bul., Vol. 15, No. 1, pp. 7-13. Sept.-Oct. 1952.

Soil movement in irrigation furrows on steep slopes is of high magnitude and hence is a problem for serious consideration by irrigators. Slopes exceeding 2 percent should be avoided, especially if the runs are long, which necessitates large streams. On steep land, furrows can be put in on a contour gradient to obtain a slope of 1 percent or less and thus prevent serious erosion. Where it is impossible to avoid steep slopes, the erosion can be kept at a minimum by careful control and limiting of the stream size. Since short runs can utilize smaller streams, it may be advisable to reduce the length of run in order to cut down on the stream size necessary.

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MORE AND BETTER PROTEINS MAKE BETTER FOOD AND FEED.

By W. A. Albrecht; Better Crops with Plant Food, Vol. 36, No. 7, pp. 9-13, +38. Aug-Sept.1952.

A more complete balanced fertility of the soil with food production for complete nutrition and maximum of good health should be our utlimate goal. Nutrition of any life form is an integration, not an addition, of separate factors, including the soil fertility. It is suggested that the problem of finding proteins enough to balance the carbohydrates and fats lies in the fertility of the soil. The declining fertility of the soil bringing lowered concentrations of crude proteins in crops brings on us the problem of detecting their amino acid deficiencies. The human's struggle for meat, the choice food protein, is merely part and parcel of the struggle by all life for its proteins.

There will be no escape from that struggle by asking our animals to eat grass grown on any soil and to give us the relief from that struggle by their solution of the problem. It is not solved when our farm animals ask the plants on less fertile soil to provide them with protein. The abundance of this nutritional necessity in our crops, in our larger numbers of domestic meat animals, and in the markets for ourselves will become possible, not because we juggle crops or systems of agriculture and economics, but only because we prot up the whole biotic pyramid consisting of microbes, plants, animals, and man by means of the most completely fertile soils as the foundation of it.

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WEED CONTROL

By Glenn C. Klingman; Better Crops with Plant Food, Vol. 36, No. 7, pp. 19-20, +42. Aug-Sept. 1952.

One pre-emergence application of 2,4-D increased corn yield 16 bushels per acre with the same fertilization and hybrid on an adjoining area which received the conventional treatment. In addition, the plot treated with 2,4-D received no cultivation.

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EFFECT OF 39 YEARS CROPPING PRACTICESON WIND ERODIBILITY AND RELATED PROPERTIES OF AN IRRIGATED CHESTNUT SOIL.

By A. P. Mazurak, A. W. Zingg and W. S. Chepil; Neb. Agr. Expt. Sta., Journal Series Paper No. 580 and Kans. Agr. Expt. Sta. Agron. Dept. Contribution No. 475.

Cropping and manurial practices with potatoes showed a marked effect on soil losses from wind. Alfalfa in rotation was superior to manure application in reducing soil losses. Application of 12 tons of barnyard manure on potato plots in a 3-year rotation reduced the soil loss from 74,500 pounds per acre to 2,720. The soil loss on non-manured plots in a 6-year rotation was 970 pounds per acre. Sugar beet plots in a similar cropping system and manurial application as on potato plots showed a smaller regimen of soil losses.

Mechanical stability of clods was greatest on plots cropped to continuous barley, followed in order by beets, corn and potatoes. Mechanical stability was greater on manured than on non-manured plots. The application of manure or growing of alfalfa in the rotation produced a marked reduction in the apparent density of clods and increased the total nitrogen and moisture content at 15 atmosphere tension. Alfalfa was superior to manure in producing these changes in soil properties.

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SUPPLEMENTAL IRRIGATION OF SWEET POTATOES.

By J. L. Bowers, R. H. Benedict and V. M. Watts; Ark. Agr. Expt. Sta. Farm Research, Vol. 1, No. 3 p. 2. Fall, 1952.

The application of about 4.5 inches of water during the growing season increased yields of marketable sweet potatoes from 336 bushels per acre to 626 bushels in 1951.

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SILT LOAD OF TEXAS STREAMS--PROGRESS REPORT NO.13

By Dean W. Bloodgood and James E. Mortensen; Tex. Board of Water Engineers, Austin, Tex. Aug. 1952.

This publication contains data showing the silt load of Texas streams for the water year of Oct. 1, 1950 to Sept. 30, 1951.

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SUBSTITUTES FOR STABLE MANURE IN COMMERCIAL VEGETABLE FARMING.

By H. G. M. Jacobson; Conn. Agr. Expt. Sta. Bul. 560. July 1952.

The purpose of this study was to determine the cooperative values of several organic materials as substitutes for stable manure in commercial vegetable farming. It was found that in addition to the winter cover crop of rye which was turned under in the spring, 16 tons of commercial dried cow manure per acre annually were needed to maintain the organic matter content of Merrimac sandy loam at its original level when planted to sweet corn, carrots, and cabbage. The study extended over a 9-year period, 1938-46 inclusive.

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TREES AND PASTURE POSSIBLE ON LAND FORMERLY USED IN STRIP-MINING.

By L. L. Knudsen and P. H. Struthers; Ohio Agr. Expt. Sta. Farm & Home Research, Vol. 37, No. 278, pp. 72-73. Sept.-Oct. 1952.

This paper reviews the progress made in putting strip-mined land to grass and trees.

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HILL GRASSLAND GIVES CREDITABLE BEEF YIELDS ON AREAS SUBJECT TO EROSION.

By H. L. Borst and Myron A. Bachtell; Ohio Agr. Expt. Sta. Farm and Home Research, Vol. 37, No. 278, pp. 76-77, +80. Sept.-Oct. 1952.

Wise land use in Ohio's southern hills demands keeping much of the area in either permanent or semi-permanent grass of high feeding value. This system of management helps to meet the problem of stopping serious soil erosion and at the same time gives fairly creditable yields of beef from acres that otherwise might have but little value. The trash mulch system of farming is well adapted to the conditions that prevail in this area.

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WHEAT PRODUCTION IN THE PANHANDLE OF TEXAS.

By Kenneth B. Porter, I. M. Atkins and C. J. Whitfield; Texas Agr. Expt. Sta. Bul. 750. June 1952.

This bulletin deals primarily with wheat production on the High Plains of the Panhandle of Texas. Subtilled plots, both for continuous wheat and wheat on fallow, out yielded plowed with mold board and oneway plows over a period of 8 years. The average annual yield on the subtilled plot in continuous wheat culture was 15.7 bushels per acre. This was 1.8 bushels per acre more than the yield on the mold board plowed plot, and 1.5 bushels more than the oneway plowed plot. The subtilled plot in the wheat on fallow system produced

an average annual yield of 24.0 bushels per acre compared with 21.2 bushels for oneway plowed plots. The yield for delayed subtillage was 24.3 bushels per acre annually.

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NITROGEN INCREASES PROTEIN IN GRAINS.

By W. A. Albrecht; Coke Oven Ammonia Research Bureau, News and Views, Vol. 7, No. 5, p. 3. Sept.-Oct., 1952.

Fertility of the soil, and not water supply and weather conditions, is responsible for the protein content of wheat. For good vegetative growth and large yields of grain, nitrogen must be available early in the growing season. For a high concentration of protein in the grain, extra nitrogen must be available shortly before heading time. By correlating the nitrogen application to the physiology of the plant so as to determine whether the nitrogen is employed in making vegetative mass or in synthesizing protein in the grain, it should be possible to produce both a large yield of bushels per acre and a high concentration or percent of protein in the grain.

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HIGH FERTILITY PREVENTS PRODUCTION LOSS.

By E. H. Tyner; Coke Oven Ammonia Research Bureau News and Views, Vol.7, No.5, p.1.Sept.-Oct.1952.

Increased nitrogen usage is ushering in an era of high yields in the corn belt.

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WATER QUALITY--AS IT INFLUENCES IRRIGATION PRACTICES AND CROP PRODUCTION--EL PASO AND PECOS AREAS.

By Paul D. Christensen and Paul J. Lyerly; Tex. Agr. Expt. Sta. Cir. 132. Aug. 1952.

This publication discusses the kinds and amounts of salts found in irrigation water, how salt affects soils and plants, the governing principles in water application, and the underground water situation in the Trans-Pecos and El Paso areas.

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PRODUCTION OF BASS AND BLUEGILLS IN MICHIGAN PONDS.

By Robert C. Ball and Howard D. Tait; Mich. Agr. Expt. Sta. Tech. Bul. 231. June 1952.

This bulletin discusses the methods of stocking farm ponds with fish and management of the ponds.

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INFILTRATION ESTIMATES FROM SOIL-PERMEABILITY DATA AND THE SOIL-CONSERVATION SURVEY IN VIRGINIA

By H. N. Holtan and M. H. Kirkpatrick, Jr.; USDA, SCS and Va. Agr. Expt. Sta., Oct. 1952.

The purpose of this paper is to present a logical method of estimating infiltration based primarily upon the land use and permeability as indicated by the soil-conservation survey and the permeability survey, respectively, for consideration and testing.

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CHRISTMAS TREES.

By A. M. Sowder; USDA, Extension Service, Agr. Information Bul. No. 94. 1952.

This bulletin discusses the tradition and trade in Christmas trees.

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WIND-TUNNEL STUDIES OF FUNDAMENTAL PROBLEMS RELATED TO WINDBREAKS.

By N. P. Woodruff and A. W. Zingg; USDA, SCS, TP-112. Aug. 1952.

This study was conducted for the purpose of obtaining fundamental information on problems related to windbreaks.

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UNITED STATES TREE BOOKS.

By William A. Dayton; USDA, Forest Service, Bibliographical Bul. No. 20. August 1952.

This is a bibliography of tree identification.

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RANGE MANAGEMENT STUDIES ON THE STATION.

By Leo B. Merrill and Vernon A. Young; Sheep and Goat Raiser, Vol.32, No.11, pp.28-30. Aug. 1952.

During the two years, July 1949, through June30, 1951, per-head gains of all classes of livestock especially cattle and sheep, in pastures stocked year-long were consistently higher on lightly stocked areas. The per-head gains the first year were considerably more on rotation pastures than on the heavily-stocked pastures and slightly less than on the moderately-stocked year-long pastures. The second year, however, the greatest per-head gains were obtained from rotation pastures.

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CONTROL OF WOODY PLANTS WITH HERBICIDES.

By C. E. Fisher; Sheep & Goat Raiser, Vol.32, No. 12, pp. 18-19. Sept. 1952.

This paper discusses the use of chemicals in controlling woody plants on range and pastures.

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USE OF PITTED AREAS IN GRASS CULTURE.

By C. A. Rechenthin; Sheep and Goat Raiser, Vol. 32, No. 12, pp. 48-49, Sept. 1952.

This paper explains how 2,000 acres in the Big Bend National Park in Texas have been restored to grass by pitting and reseeding.

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GRASS DURING DROUTH.

By B. W. Allred, Sheep and Goat Raiser, Vol. 33, No. 3, pp. 24-26. Dec. 1952.

With flexible livestock operation, timely adjustments can be made to keep numbers of animals in line with forage yields without depleting herds or grass either. Ranches having good stands of vigorous grasses prior to the drouth appear to have lost a small amount of ground cover but there are enough good plants left to restore them to original conditions within a year or two provided grazing is moderate.

Ranges in poor condition before the drouth suffered most. As much as 30 to 60 percent of ground cover was destroyed and several years of light grazing will be required before they will be as good as before the drouth. Where rains have fallen recently, ranges with plenty of stubble and litter left are recovering from the drouth far better than ranges with litter and stubble gone.

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A RANCHER WRITES ABOUT GRASS.

By Joe M. Egan; Sheep and Goat Raiser, Vol.33, No. 3, pp. 34-36. Dec. 1952.

The author explains how a thousand acres of hills and rocks in the southwest corner of Gillespie County, Texas consisting of limestone soil were reclaimed from cedar and put to profitable production of grass.

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PEAVINE--A POISONOUS RANGE PLANT IN TEXAS.

By Omer E. Sperry, Phillip H. Vardiman and Robert G. Gray; Texas Agr. Expt. Sta., College Station, Tex. Progress Report 1474. July 5,1952.

Peavine, principally Astragalus emoryanus, is toxic to cattle, sheep and goats in certain sites in the Big Bend area and in localized places along the Llano River. Peavine, an annual legume, is closely related to and often grows in association with species of Astragalus called loco, garboncillo and crazy weed. The plant has a slender taproot and slender decumbent stems which branch at the base and bear odd-pinnate leaves. In short grass areas and onopen ground, the plant assumes a prostrate habit. A single plant may cover only a few square inches or it may become 2 to 3 feet in diameter. When it grows on moist-grassy sites the plant often develops a few-stemmed upright habit.

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EFFECT OF DIFFERENT SOURCES OF PHOSPHATE ON YIELD AND BOTANICAL COMPOSITION OF PASTURE VEGETATION.

By R. P. Bates and E. D. Cook; Texas Agr. Expt. Sta., College Station, Tex. Progress Report 1481. Aug. 2, 1952.

Forage harvested from the plots consisted of a mixture of native and seeded grasses. The percent of each varied at different dates and with different treatments. The native grasses furnished most of the forage the first year but, in 1951, the seeded species furnished most of the forage for certain fertilizer treatments.

There was no significant difference in forage yields between rock phosphate and superphosphate applied along, or among the three phosphorus treatments when potash was added. Yields for the treatments, however, were significantly greater than the check, potash alone, lime alone or lime and potash together. Potash alone, lime alone or lime and potash together did not produce forage yields significantly greater than the check plot.

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GRASSLAND IN CONSERVATION FARMING.

By Robert M. Salter; Jour. Soil and Water Conserv. Vol. 7, No. 4, pp. 163-170, +198. Sept. 1952.

This paper discusses the importance of grass in a conservation farming program.

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A NEW CONCEPT OF CONSERVATION.

By Morris E. Fonda; Jour. Soil & Water Conserv., Vol. 7, No. 4, pp. 171-173. Sept. 1952.

This paper discusses the changes the concept of erosion control has undergone.

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SOME LIMITATIONS ON THE USE OF SUCCULENTS FOR EROSION CONTROL.

By D. M. Ilch; Jour. Soil and Water Conserv.,Vol. 7, No. 4, pp. 174-176, +196. Sept. 1952.

This paper discusses the limitations in the use of succulent vegetation in the erosion control program.

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KENTUCKY 31 FESCUE PROVES ITS VALUE.

By W. J. Fonville; Jour. Soil & Water Conserv., Vol.7, No. 4, pp. 177-183. Sept. 1952.

Many acres have "gone to grass" within the past decade and there are many more which should go as the best safe use for them. In the logical search for adopted grazing plants which has gone along with this change, several plants have demonstrated real merit. Of the grasses tried, two varieties of tall fescue have been rather outstanding, especially in the southeast. They are Kentucky 31 and Alta.

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TWO-WAY PLOW FOR MAINTAINING TERRACED LAND.

By Maurice B. Cox; Jour. Soil & Water Conserv., Vol. 7, No. 4, pp. 187-188. Sept. 1952.

This paper describes a two-way plow that is useful in maintaining terraces.

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GRAPHICAL SOLUTION OF PROBABLE SOIL LOSS FORMULA FOR THE NORTHEASTERN REGIONS.

By Charles H. Lloyd and Gail W. Eley; Jour. Soil and Water Conserv., Vol.7, No.4, pp. 189-191. Sept. 1952.

The authors describe a graphic formula developed for the purpose of estimating probable soil loss.

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ABSORPTION AND TRANSLOCATION OF PHOSPHORUS BY FOLIAGE.

By W. F. Oliver; Sci. Agr., Vol. 32, No. 8, pp. 427-432. Aug. 1952.

Using labelled phosphatic fertilizers, it was shown that phosphorus applied to the foliage of beans and corn can be absorbed and translocated throughout the plant. The absorption and translocation is greatest in the rapidly growing parts of the plant. The phosphorus content of beans and corn in locations where phosphatic fertilizers have been applied to the surface of the soil may be due in part to absorption from fertilizer particles splashed on the leaves by raindrops.

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A BORON DEFICIENCY IN PEAR GROWING IN SOIL HAVING AN ADEQUATE BORON CONTENT.

By C. G. Woodbridge, A. Carney and H. R. McLarty; Sci. Agr., Vol. 32, No. 8, pp.440-442. Aug. 1952.

A disorder in pear trees, similar to that caused by boron deficiency, is briefly described. Chemical analysis of affected tissues indicated a boron content that is normally associated with deficiency symptoms. Chemical analysis of the soil in which the trees were growing indicated a boron content that is adequate for tree development. A lowering of the soil moisture content in the fall and early spring is considered to be responsible for the occurrence of the deficiency.

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THE RELATIONSHIP BETWEEN PHOSPHATE RESPONSE AND BASE SATURATION IN ACID SOILS.

By H. F. Birch; Jour. Agr. Sci., Vol.42, No. 3, pp. 276-285. July 1952.

Phosphate responses were found to be very significantly and inversely related both to the percentage saturation of the base exchange capacity and exchangeable calcium as a percentage of exchangeable calcium plus hydrogen. The availability of the native soil phosphate was significantly and directly related to these values. The relationships between phosphate response or availability and the amounts of acid-soluble, adsorbed and water-soluble phosphate in the soils were much less conclusive. In acid soils considerable amounts of phosphate can be retained in a plant-available form associated with exchangeable bases, namely calcium.

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EXPERIMENTS ON IRRIGATION OF SUGAR BEETS.

By H. L. Penman; Jour. Agr. Sci., Vol.42, No. 3, pp. 286-292. July 1952.

It is assumed that maximum growth requires maximum transpiration and that maximum transpiration can be maintained by keeping the soil near to field capacity throughout the growing season. Transpiration rates can be calculated from weather data and the paper describes four field experiments in which attempts were made to control the water content of the soil throughout the growing season, by irrigation from overhead spray-lines. In spite of differences in season and soil, the four sets of data are consistent in showing that maximum sugar yield is obtained when the soil-moisture deficit does not exceed about 2 inches in mid-July or about 4 inches in mid-September.

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CONSUMPTIVE USE OF WATER STUDIES PROVIDE BASIS FOR DIVISION OF THE WATERS OF THE COLORADO RIVER

By E. K. Fuhriman and W. D. Criddle; Utah Agr. Expt. Sta. Farm and Home Science, Vol. 13, No.4, pp. 86-87, +100. Dec. 1952.

This paper reports the results of studies conducted in Ashley and Fernon Valleys in Utah to determine the consumptive use of water by all types of vegetative growth in these valleys. The results show that even sparse native vegetation

consumes almost an acre foot of water per acre per year. Heavier growths in wet areas use up to 50 inches of water per year. Alfalfa and irrigated pasture have a consumptive use of 33 inches per year, while corn and small grains use about 22inches.

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IRRIGATION MORE EFFECTIVE WITH CLOSER SPACED FURROWS.

By Sterling A. Taylor; Utah Agr. Expt. Sta. Farm and Home Science, Vol. 13, No. 4, pp. 84-85, +99. Dec. 1952.

This study shows that furrows for irrigation should be somewhat less than twice the depth of rooting of the plant, hence furrows should be closer in shallow rooted than in deep rooted crops. With closer spaced furrows the water will mover laterally and wet the soil in the middle of the row while it is moving vertically to the moist soil below. The use of Krilium and detergents seems to offer some possibilities for increasing water entry into slowly penetrable soils such as those with high amounts of salts or alkali.

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MORE BEEF FROM OUR BRUSHY ACRES.

By Charles E. Hughes; Armour's Analysis(Chicago, Ill.) Vol. 1, No. 4, pp. 1-4. July 1952.

This paper explains how land in Texas and Oklahoma infested with mesquite and other shrubs is being converted to productive pasture land by replacing the brush with adapted grasses.

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ADEQUACY OF BASIC DATA IN HYDROLOGY AND SEDIMENTATION.

By William A. Liddell and Carl B. Brown; Dept. of the Interior, Bureau of Reclamation. July 1950

This report contains information on the adequacy of various types of basic hydrologic data, including precipitation, evaporation, snow surveys, surface water, ground-water, soil moisture, chemical water quality, and sanitary water quality. It summarizes the adequacy of the hydrologic data in Alaska, Hawaii and in the island possessions and territories. It contains a section on the adequacy and accuracy of present methods of collecting water resources basic data. Another section deals with the adequacy of sedimentation data in the United States, including sediment load data, reservoir sedimentation surveys, and channel stability surveys. Finally, the report contains a statement on the adequacy of hydrologic and sedimentation research.

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HERBICIDES: A NEW TOOL FOR USE IN STUDYING SOIL PHYSICAL PROPERTIES AFFECTING CROP GROWTH.

By C. L. W. Swanson and H. G. M. Jacobson; Weeds, Vol. 1, No. 2, pp. 174-184. Jan. 1952.

The advent of herbicides made a new tool available for studying the effect of soil physical properties on crop growth. This paper discusses results obtained from the use of this tool on corn.

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COTTON BURS AND COTTON BUR ASHES AS FERTILIZER FOR COTTON ON A CLAYPAN SOIL.

By Horace J. Harper; Okla. Agr. Expt. Sta. Bul. B-387. Oct. 1952.

This bulletin reports a 24-year comparison of cotton burs and cotton bur ashes as a fertilizer. The comparison was made on a claypan soil with cotton grown every year as the test crop. This soil was low in available phosphorus but fairly high in organic matter. The exchangeable potassium was high enough so that crop responses from potash fertilization was not profitable on adjacent plots where cotton was grown for a similar period.

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THE CHANGING FERTILITY OF NEW ENGLAND SOILS.

By C. L. W. Swanson, L. T. Kardos, W. H. Lyford, A. L. Mehring, R. Q. Parks, G. L. Terman, and R. A. Struchtemeyer; Conn. Agr. Expt. Sta. Mimeo. Aug. 1952.

This is a report of the Northeastern Soil Research Committee relative to the regional aspects of soils research. It presents suggestions on soil, fertilizer and irrigation research problems.

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EFFECT OF FERTILIZER APPLICATION ON YIELDS OF CORN AND COMPOSITION OF LEAF TISSUE AT MOSES LAKE

By Frank G. Viets, Jr., C. Emil Nelson and Carl Crawford; USDA-BPISAE. Mimeo. Sept. 1952.

This is a report of a study conducted to determine the nitrogen, phosphorus and potash requirements of corn following alfalfa and to test the applicability of the critical nutrient concentrations on the 6th leaf selected at silking.

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BRUSH AND TREE REMOVING MACHINERY.

By Maurice B. Cox; Okla. Agr. Expt. Sta.Bul.B-310. May. 1947.

This bulletin describes and illustrates a number of types of machines which have been tested in removing brush from pasture land.

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A STUDY OF THE RATE OF MATURITY AND YIELDS OF 12 VARIETIES OF GRAIN SORGHUM AND THE HCN CONTENT OF CERTAIN SORGHUMS.

By C. E. Nelson; USDA, BPIS&AE, Mimeo. Apr. 1952.

The moisture content of head samples of 12 varieties of sorghums taken periodically from September 1 until the time of harvest was used as a basis for determining the maturity of the plants.

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SOIL CONDITIONERS AWAKEN NEW INTEREST IN SOILS.

By C. L. W. Swanson; Conn. Agr. Expt. Sta., Frontiers of Plant Science, Vol. 5, No. 1, pp. 4-5. Nov. 1952.

The author discusses the use of the new group of agricultural chemicals called soil conditioners. Their uses and limitations in light of present knowledge are discussed briefly.

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A NATIONAL OBJECTIVE--MORE EFFICIENT USE OF FERTILIZER AND LIME.

By W. A. Minor; National Fertilizer Review, Vol. 27, No. 4, pp. 3-6. Dec. 1952.

This paper explains why more efficient use of fertilizer and lime is essential to an expanding economy.

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SOIL CONDITIONERS AND FERTILIZERS

By W. P. Martin and G. W. Volk; National Fertilizer Review, Vol. 27, No. 4, pp. 11-13. Dec.1952.

This paper discusses the relationship between soil conditioners and chemical fertilizers in crop production.

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DEVELOPING AND TESTING IRRIGATION WELLS.

By Tom O. Meeks; USDA, SCS, Region 6 (Albuquerque N. M.) Bul. 114. March 1952.

This paper describes methods of developing and testing irrigation wells.

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GRAPHIC SOLUTION OF PROBABLE SOIL LOSS FORMULA.

By Gail W. Eley and Charles H. Lloyd; USDA, SCS, Misc. Pub. 204. Jan. 1952.

This paper attempts to show the relative soil loss from crops under various cropping conditions in percentage of loss for continuous corn by use of graphs based on the formula:

$$E = F \times S^{1.25} \times L^{0.35} \times P^{1.75} \times C$$

where

E = Probable soil loss in tons per acre per year
F = Soil factor (relative erodability of soil under continuous cultivation up and down slope)
S = Slope in percent
L = Length of slope
P = Rainfall 2-year frequency 30 minute maximum intensity in inches
C = Cropping factor

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FARM DRAINAGE

By Lewis A. Jones; USDA, Farmer's Bul. 2046. Oct. 1952.

This bulletin supersedes Farmer's Bulletin 1606 and brings the information on farm drainage up to date. It is a practical guide for both farmers and engineers who deal with the problem.

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SLASH PINE PLANTING MAKES REMARKABLE GROWTH.

By J. A. Gibbs and Kenneth Lane; Jour. Forestry, Vol. 50, No. 11, pp. 837-839. Nov. 1952.

This paper presents the yield data from a 14-year old slash pine planting located on low, imperfectly drained, flatwoods land of Leon, Rex and Ona soils. The results show that the returns per acre from timber can be expected to approximate those derived from cultivated crops. Management is much less complicated and the chance of soil erosion and soil fertility depletion is greatly reduced.

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SURVIVAL AND GROWTH OF FOREST PLANTINGS IN MISSOURI.

By Richard W. Dingle; Jour. Forestry, Vol. 50, No. 11, pp. 845-849. Nov. 1952.

Apparently survival of forest plantings in Missouri is affected most critically by the influence of the man-controlled factors involved in establishment treatment. Climatic and soil factors also have an important bearing upon survival, as indicated by the effects of erosion and aspect. In the main, however, survival is dependent upon condition of site at the time of planting, the planting method used to establish the plantation, condition of stock at the time of planting, and plantation care.

Growth of forest plantations is dependent to some extent upon species, aspect, erosion, condition at the time of planting, and grazing. However, the most important factors affecting growth are probably those which affect the excellence of planting sites.

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ESTABLISHMENT OF EASTERN REDCEDAR BY DIRECT SEEDING.

By Johnson Parker; Jour. Forestry, Vol. 50, No. 12, pp. 914-917. Dec. 1952.

Direct seeding of eastern redcedar in the forest on two widely different soils, under closed and open canopies, and with litter removed or left in place showed no differences in number of seedlings established between soil series, whether seeds were screened or unscreened against animals. Seedlings under open canopies, however, survived better than those under closed, and seedlings showed much better establishment on spots where the litter was cleared off.

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FACTORS AFFECTING CROP PRODUCTION AND FARM INCOME FOR A MIAMI SOIL ASSOCIATION IN OHIO.

By R. H. Blosser; Ohio Agr. Expt. Sta. Research Bul. 713. Dec. 1952.

The purpose of this study was to determine how different amounts of meadow crop affect farm income on an area where erosion control is not a major problem. Comparisons were made between the two rotations most commonly found in a Miami soil association area. Economic returns are discussed in terms of income per farm and income per hour of labor. The conclusions apply only to a specific association. Consideration also is given to individual factors affecting the returns from different amounts of hay and pasture in the rotation.

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ABSTRACTS OF RECENT PUBLISHED MATERIAL ON SOIL AND WATER CONSERVATION.

By J. H. Stallings; USDA-SCS, PA-213, Washington 25, D. C. Oct. 1952.

The purpose of this publication is to bring together a summary of current information about soil and water conservation for ready reference to those who are actively engaged in soil conservation work. It contains abstracts of papers published by personnel in the Bureau of Plant Industry, Soils and Agricultural Engineering, Soil Conservation Service, cooperating agencies and other conservation workers. It consists of subject matter index, abstracts and author index.

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MANAGING DRAINAGE SYSTEMS.

By John G. Sutton; USDA, Farmer's Bul.2047. Oct. 1952.

This bulletin describes methods of maintaining drains and discusses the importance of planning for such work.

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WHY SOME FARMS EARN SO MUCH MORE THAN OTHERS.

By M. L. Mosher and V. I. West; Ill. Agr. Expt. Sta. Bul. 558. Aug. 1952.

The study reported was undertaken to learn the net effect on earnings of each of several factors used in measuring the efficiency of organization and operation of farms and to find the relationships between each factor and each of the other factors. A preliminary study showed that the selected factors were related to farm earnings. It is recognized that it is difficult to isolate the net effects of such complex and related factors.

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SOIL-BORNE WHEAT MOSAIC.

By Benjamin Koehler, W. M. Bever, and O. T. Bonnett; Ill. Agr. Expt. Sta. Bul. 556. Aug.1952.

This bulletin discusses soil-borne wheat mosaic which under some conditions has caused almost complete crop failure. The development of resistant varieties has made wheat production possible in parts of the state where it is now an important crop. Severe losses occur now only when farmers fail to plant resistant varieties.

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FERTILIZER PLACEMENT FOR CONNECTICUT TOBACCO.

By T. R. Swanback and P. J. Anderson; Conn. Agr. Expt. Sta. (New Haven) Bul. 561. Nov. 1952.

This bulletin presents the results of fertilizer placement tests extending over a period of ten years. Broadcasting the fertilizer in the usual way was preferable to drilling it in bands close to the row. Root injury by the fertilizer concentration was the main objection to the band method.

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CHEMICAL WEED CONTROL - 1951 SCREENING EXPERIMENTS.

By D. A. Hinkle, Francis Williams, and Noah S. Peek; Ark. Agr. Expt. Sta. Report Series No. 31. March 1952.

This report covers a third season's work on chemical weed control, conducted in 1951. It covers work done in screening chemicals and determining their effect upon weeds and crops when applied at different rates and times and by different methods. The studies included tests on corn, cotton, and soybeans.

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CHEMICAL DEFOLIATION OF COTTON.

By R. O. Thomas, W. F. Buchele and J. M. Jackson; Ark. Agr. Expt. Sta. Report Ser. No. 27. June1951

This study included field tests to obtain information on different defoliant materials, proper timing, application and the production and development of machinery for spray applications.

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CORN FERTILIZER AND SPACING TESTS-1948 to 1950.

By D. A. Hinkle; Ark. Agr. Expt. Sta. Report Ser. No. 24. May 1951.

The purpose of this study was to determine the relationship between stand population and the amount of nitrogen applied to the corn crop as a side dressing.

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RICE FERTILIZATION-RESULTS OF TESTS FROM 1946 THROUGH 1951.

By R. L. Beacher; Ark. Agr. Expt. Sta. Bul. 522 June 1952.

The relative effects on rice of various forms of commercial nitrogeneous fertilizers, including anhydrous ammonia, at different rates and times of application were investigated. Tests with phosphate and potash fertilizers were conducted to obtain additional information as to the particular soil areas, management programs and other conditions under which either or both of these materials will profitably increase rice yields.

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SOIL IMPROVEMENT PRACTICES AFFECTING YIELDS OF COTTON.

By R. P. Bartholomew; Ark. Agr. Expt. Sta. Bul. 513. June 1951.

Studies of the effect of various soil improvement practices on yield of cotton were conducted on 5 experiment stations and on cooperator farms for more than 20 years. The practices included the use of crop rotation, turning under summer and winter legumes for soil improvement, and the application of different fertilizer materials.

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SOIL AND CROP MANAGEMENT PRACTICES FOR '53.

By E. R. Duncan, W. D. Shrader and John Pesek; Iowa State College, Farm Science, Vol. 7, No. 7, pp. 22-23. Jan. 1953.

This paper contains soil and crop management suggestions for corn, soybeans and meadows for 1953.

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CONTROL OF WEED AND GRASS SEEDLINGS IN OLD COTTON

By H. E. Rea; Texas Agr. Expt. Sta. Progress Report 1511. December 2, 1952.

Four water soluble contact herbicides and flame cultivation were used to control Johnson grass and morning glory seedlings in cotton at lay-by in an experiment on Norwood silty clay loam soil near College Station in 1952. Sinox PE, Premerge, ammonium nitrate and N.i.x. were the herbicides tested. A single application of each of these chemicals was more effective than a single flame cultivation. Premerge at the rate of 6-2/3 quarts in 80 gallons of water per acre gave almost perfect clean-up as a lay-by spray. None of these treatments injured the cotton materially

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COTTON DEFOLIATION IN THE LOWER RIO GRANDE VALLEY, 1952.

By J. L. Hubbard, C. S. Miller, N. J. Cain and W. R. Cowley; Texas Agr. Expt. Sta. Progress Report 1516. December 11, 1952.

The data presented indicate that good defoliation may be obtained with spray materials applied by ground rigs. Satisfactory defoliation depends on good coverage of the leaves. The gallonage per acre must necessarily be high in tall rank cotton.

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POST-EMERGENCE EFFECTS OF N-1-NAPHTHYL PHTHALAMIC ACID AND ITS DERIVATIVES ON COTTON AND CERTAIN WEEDS.

By H. E. Rea; Texas Agr. Expt. Sta. Progress Report 1517. Dec. 12, 1952.

The post-emergence use of four phthalamic acid materials was investigated in 1952.

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CONTINUOUS PLANT COVER--THE KEY TO SOIL AND WATER CONSERVATION.

By J. H. Stallings; Jour. Soil & Water Conserva. Vol. 8, No. 1, pp. 27-43, Jan. 1953, and Vol. 8, No. 2, pp. 63-68, Mar. 1953.

This paper, in two parts, explains the role of plants in preserving and building soil and why continuous plant cover is essential to a successful soil and water conservation program. It shows that the primary function of plant cover is to protect soil from erosion by absorbing the destructive energy of wind and falling raindrops, describes how the losses of plant nutrients and soil organic matter by erosion can be controlled by plant cover, how the use of continuous plant cover is the only practical means by which the organic matter content can be maintained and actually increased, how it aids in building up

and maintaining a high degree of aggregation or tilth and productivity, and how it aids in preserving moisture by increasing infiltration and decreasing runoff, and consequent soil loss.

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THE FARM EQUIPMENT INDUSTRY IN SOIL CONSERVATION

By G. E. Ryerson and Ken Huddleston; Jour. Soil & Water Conserv., Vol. 8, No. 1, pp. 14-20. Jan. 1953.

This paper shows how the farm equipment industry is contributing to conservation farming by helping to get the job done on time; by providing machinery for irrigation, drainage and terrace work; by helping to check soil erosion; by giving support in educational and informational activities; and by aiding the farmer in his work by machinery designed for earth moving, land clearing, irrigation developments, mulch tillage, harvesting, and seeding.

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ROCK PHOSPHATE FOR DIRECT APPLICATION--A NATURAL IN SOIL CONSERVATION WORK PLANS.

By A. L. Lang; Jour. Soil & Water Conserv., Vol. 8, No. 1, pp. 21-24, +28. Jan. 1953.

This paper tells of the need for rock phosphate as a source of phosphorus for worn out, impoverished, acid subsurface layers of many soils since it is quickly available to penetrating roots of plants, yet the mass of phosphorus so applied will not become indefinitely fixed as is generally true in the more soluble phosphorus carriers.

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FORESTRY AS A PART OF THE FARM ENTERPRISE.

By W. S. Swingler; Jour. Soil & Water Conserv., Vol. 8, No. 1, pp. 29-32. Jan. 1953.

Forestry on the farm is now big business. There has been a seven-fold increase in the value of farm forest products in the past decade representing a great variety of products such as lumber, for use on the farm and for sale, fence posts, railroad ties, pulpwood, poles and pilings, and in particular localities, bean poles, tobacco sticks and wood, Christmas trees, and the like, bringing a continuous and substantial source of income to the farmer.

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YOUR SOIL--CRUMBLY OR CLODDY.

By A. M. O'Neal and A. A. Klingebiel; USDA, SCS, Leaflet No. 328. Aug. 1952.

This leaflet tells why soils are different and how cultivation has changed soil tilth and productivity.

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SANBORN FIELD--FIFTY YEARS OF FIELD EXPERIMENTS WITH CROP ROTATIONS, MANURE AND FERTILIZERS.

By G. E. Smith; Missouri Agr. Expt. Sta., Bul. 458. Dec. 1942.

This bulletin tells the story of one of the oldest experiment fields in the United States and gives the results of 50 years of experimentation with crop rotations, manure, fertilizers and other soil management practices.

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SOME SOIL AND CROP FACTS.

Missouri Agr. Expt. Sta. Progress Report 20. May 1952.

This brief report gives information about Missouri soils and crops as shown by experiments on the University's various test plots and fields.

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HAIRY VETCH--LEGUME FOR SANDY DRY-LAND SOILS.

By T. H. Gooding and J. C. Russell; What's New in Crops & Soils, Vol. 5, No. 5, pp. 12-14. Feb. 1952.

Hairy vetch, one of the oldest of the vetches, is rapidly becoming an important leguminous crop on sandy lands in Nebraska. It is the most promising legume being used for soil improvement.

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NEW COTTON STRAINS RESIST BACTERIAL BLIGHT.

By L. S. Bird; What's New in Crops & Soils, Vol. 5, No. 5, pp. 16-17. Feb. 1953.

New plant breeding knowledge offers a path towards strains of cotton which can resist bacterial blight infection. As a result, bacterial blight may soon be under partial control.

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SEEDING NATIVE GRASSES.

By A. D. Stoez; What's New in Crops & Soils, Vol. 5, No. 5, pp. 18-20. Feb. 1953.

This paper discusses some of the problems involved in seeding native grasses.

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PERENNIAL SORGHUM, A NEW FORAGE CROP FOR FARMS IN SOUTHERN U. S.

What's New in Crops & Soils, Vol. 5, No. 5, p.20. Feb. 1953.

This paper describes a perennial sorghum, a natural hybrid of Johnson and Sudan grass, which promises to be an important crop in the South. The plant has the tall luxuriant growth characteristics

of Sudan combined with the perennial growth of Johnson grass. It does not show the obnoxious spreading by underground rootstalks characteristic of Johnson grass.

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REFORESTATION OF STRIP-MINED LANDS IN WEST VIRGINIA.

By H. Spencer Potter, Sidney Weitzman and George R. Trimble, Jr.; USDA-Forest Service, Sta. Paper No. 43. June 1951.

This report gives briefly the character of strip-mined lands and methods of getting such lands reforested.

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ETHYLENE DIBROMIDE CONTROLS A ROOT ROT AT THE W. W. ASHE NURSERY.

By Berch W. Henry; Tree Planters' Notes, No. 7 (USDA Forest Service) pp.2-4. Sept. 1951.

This paper gives the results of studies carried on to find a practical control for root rot disease at a nursery in Mississippi.

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WHITE GRUBS AND THEIR CONTROL IN FOREST TREE NURSERIES.

By Roy D. Shenefelt and H. G. Simkover; Tree Planters' Notes, No. 7 (USDA Forest Service) pp. 5-9. Sept. 1951.

This paper discusses results of attempts to control the severe losses in Wisconsin forest tree nurseries caused by white grubs.

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ALLYL ALCOHOL FOR WEED CONTROL IN FOREST NURSERIES.

By J. H. Stoeckeler, E. I. Roe and R. O. Sowash; Tree Planters' Notes, No. 7 (USDA Forest Service) pp. 10-12. Sept. 1951.

Results of experiments in weed control in forest nurseries in northern Minnesota are reported.

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ALLYL ALCOHOL APPLICATION THROUGH THE OVERHEAD SPRINKLER SYSTEM.

By Karl Lanquist; Tree Planters' Notes, No. 7 (USDA Forest Service) pp. 12-13. Sept. 1951.

This is a report of chemical weed control through the overhead sprinkler system at the Mt. Shasta nurseries in California.

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CONTROL OF WEEDS IN THE NURSERY BY CHEMICALS.

By J. H. Stoeckeler; Tree Planters' Notes, No. 7 (USDA Forest Service) pp. 14-17. Sept. 1951.

Results of experiments with chemical weed controls in Wisconsin are given.

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METHYL BROMIDE TO CONTROL WEEDS IN CONIFER SEEDBEDS.

By E. D. Clifford; Tree Planters' Notes No. 7 (USDA Forest Service) pp. 17-18. Sept. 1951.

This is a brief report of experiments to control weeds, white grubs and nematodes in conifer seedbeds.

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RELATION BETWEEN TOPOGRAPHY, SOIL CHARACTERISTICS AND THE SITE INDEX OF WHITE OAK IN SOUTHEASTERN OHIO.

By. R. N. Gaiser; USDA-Forest Service, Tech. Paper No. 121. July 1951.

The quality of land in southeastern Ohio for the growth of white oak depends upon the position of the site with respect to the adjacent ridge and stream lines, the exposure of the site, and the depth of the surface soil. The total available moisture in the A horizon also influences site quality but this factor is closely linked with the depth of the horizon. Subsoil properties have slight effect on site quality.

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OVERBURDEN ANALYSES AND STRIP-MINE CONDITIONS IN THE NORTHWESTERN DISTRICT OF THE OHIO COAL-MINING REGION.

By G. A. Limstrom and R. W. Merz; USDA-Forest Service, Tech. Paper No. 124. July 1951.

This is a report of conditions affecting reclamation measures for strip-mined lands in Ohio. Each area requires a distinctive treatment, and the practitioner needs detailed information to help him choose the best possible uses for these lands. The main purposes of the report are to summarize the data for ready use and to contribute to the general knowledge of Ohio geology.

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GIRDLING AND POISONING OF LIVE CULLS.

By J. A. Klein; Tech. Notes No. 13, Alaska Forest Research Center (USDA-Forest Service) Mar. 1951.

Poisoning live culls in the climax pulp timber stands was found to be faster and easier than girdling with a chain saw or axe.

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CHEMICAL BRUSH CONTROL.

By L. W. Zach; Tech. Notes No. 8, Alaska Forest Research Center (USDA-Forest Service) Mar.1951.

Spraying, using two concentrations of Ammate and one of Esteron 44, gave nearly complete kills of alder, willow, salmonberry, devils club and blueberry by fall. Grass seemed to benefit from eliminating the brush competition.

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THE USE OF CHEMICALS TO CONTROL INFERIOR TREES IN THE MANAGEMENT OF LOBLOLLY PINE.

By L. E. Chaiken; USDA-Forest Service, Sta. Paper No. 10. Sept. 1951.

This paper reports results of the use of chemicals in the control of undesirable species in loblolly pine forests.

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INTERSPECIES HYBRIDS IN PINES.

By F. I. Righter and J. W. Duffield; Jour. Heredity, Vol. 42, No. 8, pp. 75-80. Mar.-Apr. 1951.

The practical purpose of the crossing program is to produce promising hybrids for extensive testing in forest plantings by methods specially devised for testing particular characters.

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PLANTING COTTONWOOD ON BOTTOMLANDS.

By Henry Bull and H. H. Muntz; Miss. Agr. Expt. Sta. Bul. 391. Aug. 1943.

Recommendations and methods for planting cottonwoods in bottomlands are listed.

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SOME EFFECTS OF SOIL AND TOPOGRAPHY ON OAK YIELDS IN SOUTHERN MICHIGAN.

By John L. Arend and Leslie W. Gysel; USDA-Forest Service, Univ. of Minn., and Lake State Forest Expt. Sta.; Tech. Notes, No. 365. Oct. 1951.

Combinations of soil texture and topography, as they affect soil moisture, are the principal site factors influencing the growth and yield of oaks.

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OBSERVATIONS ON LITTER FALL AND FOLIAGE NUTRIENT CONTENT OF SOME PACIFIC NORTHWEST TREE SPECIES.

By Robert F. Tarrant, Leo A. Isaac and Robert F. Chandler, Jr.; Jour. Forestry, Vol. 49, No. 12, pp. 914-915. Dec. 1951.

The findings of this paper emphasize the soil-building value of western red cedar and red alder in western forests and should be of use in the control of species composition in reforestation programs.

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DIFFERENCES IN INFILTRATION RATES ON GRADED AND UNGRADED STRIP-MINED LANDS.

By Robert W. Merz and Raymond F. Finn; USDA-Forest Service, Sta. Notes No. 65. Aug. 1951.

Examinations of young plantations on graded and ungraded strip-mined lands indicate that grading has had a harmful effect on tree survival and growth of some sites. The mean infiltration rate on the ungraded banks was significantly higher than on the graded banks.

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THE MORROW PLOTS--AMERICA'S OLDEST EXPERIMENT FIELD--ESTABLISHED IN 1876.

By F. C. Bauer and C. H. Farnham; Ill. Agr. Expt. Sta. AG 948. 1948.

Here are being demonstrated practical lessons in soil management exemplifying both soil improvement and soil depletion. Corn yields on these plots range from 27 to 93 bushels per acre according to the way the land has been handled.

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FARM AND RANCH PONDS.

By Lawrence V. Compton; Soil Conservation, Vol. 18, No. 7, pp. 151-155. Feb. 1953.

The multiple-purpose farm pond, carefully located, scientifically designed and properly built, is a commonplace element in today's rural scene. They are useful for producing fish, for furnishing water for livestock, for recreation, and for promoting the production of wildlife.

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COTTON-DAIRY FARMING IN ALABAMA'S PIEDMONT.

By E. L. Mayton and Kenneth B. Roy; Ala. Agr. Expt. Sta. Cir. 111. Dec. 1952.

This is a story of a farm-scale experiment aimed at methods by which farm income in the Piedmont might be improved.

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PRODUCTION OF BAIT MINNOWS IN THE SOUTHEAST.

By E. E. Prather, J. R. Fielding, M. C. Johnson and H. S. Swingle; Ala. Agr. Expt. Sta. Cir. 112. Jan. 1953.

Experiments on production of several species of bait minnows was conducted and the resulting information regarding construction and management of commercial minnow hatcheries is reported in this publication.

THE ENGINEER'S JOB IN DEVELOPING AMERICA'S AGRICULTURAL CAPACITY TO PRODUCE.

By R. M. Salter; Paper presented at the meeting of American Society of Agricultural Engineers, Chicago, Ill. Sept. 9, 1952.

The author discusses the place of agricultural engineers in developing American agriculture.

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ANTIBIOTICS AS AGENTS FOR THE CONTROL OF CERTAIN DAMPING-OFF FUNGI.

By K. F. Gregory, O. N. Allen, A. J. Riker, and W. H. Peterson; Amer. Jour. Bot., Vol. 39, No.6, pp. 405-415. June 1952.

This paper records the properties of certain antibiotics and antibiotic-producing cultures which influenced their effectiveness as agents for the control of damping-off caused by Pythium spp. Twenty-six samples of soil, plant and chaff yielded 31 bacteria, 29 actinomycetes and 14 fungi strongly antagonistic to Pythium debaryanum. Stabilities in soil of the antibiotics produced by the four microorganisms and also conditions of actidione and fradicin were not greatly influenced by soil type or reaction.

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THE MICROOGRANISMS IN OUR SOILS--BALANCE IN SOIL LIFE FORMS THE ROLE OF THE ACTINOMYCETES.

By C. I. Nelson; North Dak. Agr. Expt. Sta. Bimonthly Bul., Vol. 15, No. 2, pp. 59-60. Nov.-Dec. 1952.

The earth is a living, changing, sensitive portion of our life. A radical change in the soil in one respect is followed by equally radical change in many other respects, until new conditions of equilibrium are obtained. This is especially true of the soil bacteria, for if the type of food to support one type of organism is exhausted what is left will support some other kind of bacteria and this shift will in turn cause numerous other changes with far-reaching results.

The soil can support many kinds of bacteria but some sorts will be favored above others under some particular condition. For example, when soil management provides for the return of crop residues and accumulation of fibrous vegetable waste is planned, a kind of soil bacteria known as Actinomycetes increases greatly in these wastes. These organisms send their little thread-like portions into and all through the stems, straws and roots and then make use of the energy that is released by the consumption of cellulose. The effect is to convert such wastes quickly into a dark brown mass about the nature and texture of peat or lignite. The cellulose is said to be "lignified." We owe to the actinomycetes, such as the very species in our soils, a debt of gratitude for the antibiotics they produce. The antibiotics antinomycin, streptothrycin, and streptomycin all originate from the species of actinomycetes found in our soil. These antibiotics are the "wonder drugs" now being used so effectively to fight disease. Yet, these substances are produced by the microorganisms for their own private use in maintaining their own activities in the soil.

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PHOSPHATE AND POTASH EFFECTS ON LADINO CLOVER SWARDS.

By L. J. Boulet and Lucien Choiniere; Better Crops with Plant Food, Vol. 37, No. 1, pp. 6-14, +39-46. Jan. 1953.

This is a preliminary report of the results obtained from studies made to determine the specific nutrient requirements of Ladino clover. The effects of rates of phosphorus and potassium fertilization on Ladino clover grown on different soils are reported.

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CHEMICAL FERTILIZER IS A SOUND INVESTMENT.

By R. A. Wasson; Better Crops with Plant Food, Vol. 37, No. 1, pp. 15-16, +50. Jan. 1953.

This paper discusses the returns, both in yields and monetary value, from the use of fertilizer on a number of crops.

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WISCONSIN'S SOIL BANK BALANCES ARE RUNNING LOW ON NITROGEN AND POTASH.

By C. J. Chapman; Better Crops with Plant Food, Vol. 37, No. 1, pp. 17-22, + 51. Jan. 1953.

A tremendous drain is being made on the plant nutrient supply of the soil in Wisconsin as shown by this paper. Figures are given showing the amounts of nitrogen, phosphoric acid and potash removed in 1952 by the major crops grown. It also indicates the amount of commercial fertilizer needed to be used annually in order to replace these elements.

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THE RELATION BETWEEN CHEMICAL COMPOSITION OF HERBAGE AND LIVESTOCK PRODUCTION.

By M. E. McCullough and W. E. Neville; Better Crops with Plant Food, Vol. 37, No. 1, pp. 23-24, +48-50. Jan. 1953.

The author states that there is no single measure which can be applied to a given sample of forage to determine its value in the production of meat, milk, or wool.

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CONTROL OF THE SUGAR BEET NEMATODE.

By Gerald Thorne; USDA Farmer's Bul. 2054. Dec. 1952.

This bulletin presents information on the value of certain crops that are generally used in rotations and gives instructions for soil fumigation. It discusses briefly the distribution, life history, and host plants of the nematode, and how it spreads.

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QUESTIONS AND ANSWERS ON AGRICULTURAL RESEARCH IN THE UNITED STATES

USDA, Agr. Res. Adm., Rev. Jan. 22, 1953.

This publication describes research conducted by the United States Department of Agriculture and the State agricultural experiment stations.

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ACCURACY OF LAND-USE CLASSIFICATION AND AREA ESTIMATES USING AERIAL PHOTOGRAPHS.

By R. C. Aldrich; Jour. Forestry, Vol. 51, No. 1, pp. 12-15. Jan. 1953.

Single aerial photographs were found adaptable for accurate forest area estimates. The accuracy of the land-use classification depended to a great extent on the accuracy of the photo-interpreter, the age of the photographs used and the season of the year during which the photographs were taken.

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EFFECTS OF THINNING ON YIELDS OF FOREST-GROWN LONGLEAF AND LOBLOLLY PINES AT URANIA, LA.

By Herman H. Chapman; Jour. Forestry, Vol. 51, No. 1, pp. 16-26. Jan. 1953.

This paper discusses the results of a study conducted to determine the severity, time and frequency of thinning on yield. Products and merchantable sizes used to measure results and the financial comparison of thinned with unthinned plots are also discussed.

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EFFECT OF TRAMPLING DISTURBANCE ON WATERSHED CONDITION, RUNOFF, AND EROSION.

By Paul E. Packer; Jour. Forestry, Vol. 51, No. 1, pp. 28-31. Jan. 1953.

This report describes a trampling disturbance study made in 1951 on a portion of the Boise River Watershed in Idaho where steep slopes, overgrazing, and a naturally unstable granitic soil have combined to create a difficult erosion control problem. Attention was focused on intermixed types of foothill spring-fall range. These included areas dominated by the native perennial olive bunch wheatgrass and by the exotic annual cheatgrass brome.

Cheatgrass range lands having less than 70 per cent ground cover are probably not in a satisfactory watershed condition and should be improved. Where these ranges have from 70 to 80 percent ground cover, light grazing use is indicated for maintenance of protective conditions. Trampling alone is apparently not too serious a consideration on ranges having ground cover of 90 percent or more.

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PROBLEMS OF RAINDROP IMPACT EROSION.

By Paul C. Ekern; Agr. Eng., Vol. 34, No. 1, pp. 23-25, +28. Jan. 1953.

The velocity of falling rain (20 mph) exceeds by 10 and perhaps by 100 times the velocity of shallow surface runoff (0.2 to 2 mph). A runoff of 10 percent of the total precipitation is frequently observed. The kinetic energy (proportional to volume times velocity squared) for falling rain ranges from 1,000 to 1,000,000 times the work capacity of shallow sheets of runoff water.

The nature of the erosive features of impacting force was delineated as:

Erosivity = f(precipitation intensity X time X (drop mass) drop cross-section) X drop velocity$^2$)

This force was shown effective in the movement of fine sand. Approximately 8 tons per acre of fine sand would be transported by the impact of drops from a rainfall of 4 inches per hour continuing for a 5-minute period. This force was shown to distribute the material over distances up to 5 feet, with a preference for the downslope direction determined as:

Downslope percent = 50 + slope percent

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A STUDY OF SOIL-WATER MOVEMENT BY ELECTRO-SOMOSIS

By Guy O. Woodward and W. McNab Miller; Agr. Eng., Vol. 34, No. 1, pp. 29-33. Jan. 1953.

This is an assembly of the published data dealing with the electrical treatment of soils.

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MOUNTING FOR PRE-EMERGE PRESS WHEEL-ROLLERS AND SPRAYER NOZZLES.

By H. P. Smith and E. C. Brown; Texas Agr. Expt. Sta. Progress Report 1520. Dec. 13, 1952.

This report discusses a machine designed for use with a tractor for the application of pre-emergence materials for control of weeds.

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EFFECT OF PLOWING UNDER LEGUMES AND APPLICATIONS OF NITROGEN ON YIELDS OF COTTON AND CORN.

By E. B. Reynolds and J. E. Roberts; Texas Agr. Expt. Sta. Prog. Rept. 1521. Dec. 15, 1952.

There were no significant differences in the average yields of cotton following legumes plowed under for soil improvement in a 2 year rotation of cotton and corn on a fine sandy loam during the 4 years, 1949-52. Good yields of corn were obtained in 1950. Very low yields resulted in 1951 and 1952 owing to lack of rain in June and July each year. The application of 60 pounds of nitrogen per acre produced a significant increase in the yield in 1950. This experiment indicates that moisture is one of the main limiting factors in corn production.

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EFFECT OF DIFFERENT RATES OF NITROGEN FERTILIZER ON THE SHIPPING QUALITY OF GREENWRAP TOMATOES.

By H. B. Sorensen and L. S. Alley; Texas Agr. Expt. Sta. Prog. Rept. 1522. Dec. 19, 1952.

An experiment conducted during 1952 indicates that the shipping quality of greenwrap tomatoes is not significantly affected by the rate of nitrogen fertilization. These results might have been different in a season of normal or above-normal rainfall, and the results given are considered inconclusive.

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EFFECTS OF CONCENTRATED BORASCU AND SODIUM CHLORATE ON THE CONTROL OF BINDWEED.

By R. D. Hamilton, C. J. Whitfield and H. E. Rea; Texas Agr. Expt. Sta. Prog. Rept. No. 1523. Dec. 20, 1952.

Low, medium and high rates of sodium chlorate and Concentrated Borascu were applied to established infestations of bindweed at 7 monthly intervals during 1950. No consistent differences in control were obtained from the various rates of the chemicals used. Slightly better control of bindweed was obtained from applications made during May, June and August than from applications made at other times. Rainfall following these applications was more favorable than following any of the other treatments.

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PRE- AND POST-EMERGENCE CHEMICAL TREATMENT COMBINATIONS IN WEEDING COTTON.

By H. E. Rea; Texas Agr. Expt. Sta. Prog. Rept. 1526. Jan. 9, 1953.

Twelve combinations of pre- and post-emergence weed control practices were tested. Premerge, CIPC and CMU reduced the stand of seedling grass 40, 36 and 90 percent, respectively, over stands on untreated areas. These chemicals reduced the stand of careless weeds 83, 50 and 99 percent, respectively. A single hoeing and cultivation reduced the stand of seedling grass and careless weeds 89 and 88 percent, without the aid of pre-emergence weed control practices, and 95 and 98 percent with such practices. The weed control practices used in this test did not materially affect the stand, growth or yield of the cotton.

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MECHANICAL HARVESTING OF COTTON, COLLEGE STATION 1952.

By H. P. Smith and E. C. Brown: Texas Agr. Expt. Sta. Prog. Rept. 1527. Jan. 9, 1953.

It was found in these tests that the higher plant populations of 40,000 to 50,000 plants per acre, giving three to four plants per foot in a 40-inch row spacing, reduced plant height, limb length and stalk diameter. Closer spacing of the plants caused the lowest limbs to be borne higher off the ground. The performance or efficiency of both the stripper and the picker-type mechanical harvesters was generally higher for the higher plant populations when the variety was suitable to the type of machine used. The rubber paddle stripper rolls gave the highest performance in harvesting eight of nine varieties. The rubber paddle and the brush stripper rolls left some green, unopen bolls and more green leaves on the plants than the steel roll. Tests with the mechanical picker showed that the performance was materially affected by both the varietal and plant characteristics as affected by plant population.

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CORN-GREEN MANURE-FERTILIZER TESTS AT PRAIRIE VIEW, 1950-52.

By Oliver E. Smith and Flake L. Fisher; Texas Agr. Expt. Sta. Prog. Rept. 1528. Jan. 13, 1953.

Three factorial fertilizer experiments with corn on a fine sandy loam following a green manure crop of cowpeas were conducted. Rainfall during these 2 years was light and unevenly distributed. Although there was a trend to higher yields when 40 pounds of nitrogen was applied, nitrogen did not significantly increase corn yields the first or second year after cowpeas. Yields were significantly increased by applications of either phosphoric acid or potash alone, or in combination. The 80-pound rate of either phosphoric acid or potash over the 2 year period was definitely superior to the 40-pound rate. The best fertilizer treatment for corn in this area appears to be 40-80-80. This is equivalent to

applying either 800 pounds of 5-10-10 or 1,000 pounds of 4-8-8 per acre.

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TESTS OF SEVERAL INSECTICIDES FOR THE CONTROL OF RESISTANT HOUSE FLIES.

By H. G. Wilson, R. S. Anders and C. N. Husman; USDA, Bur. Entmol. & Plant Quarantine. E-854. February 1953.

In 1951 residual and space-spray tests were conducted in dairies to evaluate several chlorinated hydrocarbon insecticides alone and in combination with certain synergists, for the control of house flies. All the materials tested were relatively ineffective as residues, the longest period of control achieved being about 1 week with an emulsion of lindane plus synergist RE-1901. The same material applied in emulsion form as a mist spray twice each week to dairy barns and adjacent grounds gave excellent control in every test and was superior to lindane alone.

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RELATION OF WATER-SOLUBLE BORON IN ILLINOIS SOILS TO BORON CONTENT OF ALFALFA.

By C. H. Stinson; Soil Sci., Vol. 75, No. 1, pp. 31-36. Jan. 1953.

The purpose of this study was to determine minimum requirements of alfalfa in terms of tissue concentration, relation of the soil-supplying power as indicated by water-soluble content to the boron concentration in the alfalfa plant, and the extent and severity of boron deficiency for alfalfa in Illinois, as guides for recommending use of borax fertilizer.

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EFFECT OF AMMONIATION ON AVAILABILITY OF PHOSPHORUS IN SUPERPHOSPHATES AS INDICATED BY PLANT RESPONSE.

By W. E. Martin, J. Vlamis, and J. Quick; Soil Sci., Vol. 75, No. 1, pp. 41-49. Jan. 1953.

This paper reports the results of a study which compared the availability of phosphorus in variously ammoniated superphosphates and to ascertain, if possible, relationships between citrate and water solubility of phosphorus and the plant response on a number of soils known to be accutely phosphate-deficient. Rock phosphate was included in the comparison as a source of phosphorus nearly insoluble both in water and in ammonium citrate.

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RESIDUAL EFFECTS OF SUPERPHOSPHATE APPLICATIONS ON SOIL PHOSPHORUS LEVEL AND GROWTH OF CRIMSON CLOVER AS MEASURED BY YIELD AND PHOSPHORUS UPTAKE.

By Allan B. Price; Soil Sci., Vol. 75, No. 1, pp. 51-57. Jan. 1953.

The residual effect of annual applications of phosphorus over a 36-year period was determined in part by the yields and phosphorus content of two clippings of crimson clover grown in the greenhouse. An application of superphosphate containing $P^{32}$ revealed that as the available soil phosphorus increased, the percentage of total plant phosphorus derived from the fertilizer decreased. No significant yield response was obtained from additional applications of phosphorus.

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RESIDUAL PHOSPHORUS OF HEAVILY FERTILIZED ACID SOILS.

By E. J. Rubins; Soil Sci., Vol. 75, No. 1, pp. 59-67. Jan. 1953.

The major portion of the total phosphorus of six heavily fertilized commercial potato soils was extractable with alkali. These soils were cropped continuously under greenhouse conditions without further additions of phosphorus. In general, the amounts of alkali-extractable phosphorus in the various soils were reflected in the total amounts of phosphorus removed by the crops.

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DIFFERENTIAL BEHAVIOR OF POTASSIUM METAPHOSPHATE AND SULFATE INCORPORATIONS IN SOILS.

By W. H. MacIntire, W. M. Shaw, and B. Robinson; Soil Sci., Vol. 75, No. 1, pp. 69-80. Jan. 1953.

After incorporation, potassium metaphosphate undergoes transition to potassium orthophosphate, which reacts with Ca and Mg solutes and with exchangeable Ca and Mg to form dicalcium and dimagnesium phosphates, with resultant diminution in outgo of Ca and Mg. Heavy incorporations of $KPO_3$, or its continued use at rational rate could develop a requirement for moderate additions of Ca and Mg in soils naturally deficient in those elements.

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NATIONAL COORDINATED CRABGRASS RESULTS

By Alexander M. Radko and Fred V. Grau; The Golf Course Reporter, 1951.

This is a report of results of 1951 tests of three chemicals on the control of crabgrass on four types of grasses on a nation-wide scale.

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EFFECT OF INCREASING FERTILIZER CONCENTRATION ON EXCHANGEABLE CATION STATUS OF SOILS.

By F. E. Bear, A. L. Prince and S. J. Toth; Soil Sci. Soc. Amer. Proc., Vol. 16, No. 4, pp. 327-330. Oct. 1952.

In a 10-year experiment comparisons were made of the effects of fertilizers of 1-2-2 N, $P_2O_5$, and $K_2O$ ratios, applied at the rate of 1 ton of 4-8-8 an acre annually, or its equivalent in higher grades up to and including the 12-24-24, on the exchangeable cation status of two soils. The most significant general effects of all these grades were the lowering of pH values, increase in exchangeable H, reduction in exchangeable Ca and Mg, and increase in exchangeable K. There was little in the evidence to indicate any bad effects that could not be readily overcome by the use of Mg-containing liming materials as correctives.

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LOSSES OF NITROGEN DURING DECOMPOSITION OF PLANT MATERIAL IN THE PRESENCE OF INORGANIC NITROGEN.

By Sven L. Jansson and Francis E. Clarke; Soil Sci. Soc. Amer. Proc., Vol. 16, No. 4, pp. 330-334, Oct. 1952.

Oat straw and alfalfa hay were decomposed in the presence of added inorganic nitrogen under differing conditions. Changes in organic, ammonium and oxidized forms of nitrogen were determined. With plan material in shallow (3 mm) layers and at 2/3 moisture saturation, there was loss of nitrogen in decomposition of alfalfa, but not in decomposition of oat straw. Some influences of pH, moisture content, pore size, added energy-rich materials, kind of inorganic nitrogen and of addition of germicidal materials on the occurrence and extent of denitrification are reported. Vigorous bacterial activity and an alkaline reaction were necessary for any extensive denitrification from added nitrate. An active fungus flora was commonly encountered in decomposition in which there were no appreciable losses of nitrogen. Nitrate toxicity appeared to be an important ecological factor in preventing bacterial growth and biological denitrificaation in acid substances.

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READILY AVAILABLE WATER IN FOREST SOILS.

By R. N. Gaiser; Soil Sci. Soc. Amer. Proc., Vol. 16, No. 4, pp. 334-338. Oct. 1952.

Sustained maximum and minimum soil moisture levels are in close agreement with the moisture equivalent and permanent-wilting percentage as determined in the laboratory and greenhouse. Data on the relationship of readily available water to soil texture are presented for the soils of the Muskingum-Wellston-Zanesville association. Moisture losses from the soil through transpiration and evaporation during a growing season amounted to 13, 12, and 23 inches for the soils examined. The greatest loss was from Zaleski loam on a lower slope, and the smaller losses were from Wellston silt loam and Muskingum loam found on a ridge and upper slope. It is believed that moisture losses through evaporation from the soil proper are small and that the losses reported closely approximate the amount of moisture extracted for transpiration. Because utilization of water is complete on the moist sites, it appears that the oak forests are capable of transpiring more water than is ordinarily available.

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LOSS OF PHOSPHORUS BY EROSION.

By L. E. Ensminger; Soil Sci. Soc. Amer. Proc., Vol. 16, No. 4, pp. 338-342. Oct. 1952.

A study was made of the phosphorus status of soils which had received phosphate applications over a period of years to determine the loss of phosphorus by erosion. Phosphorus that could not be accounted for by analysis of the surface 16 inches of soil and by crop removal was assumed to be loss by erosion. Where corn and cotton was used as the rotation, an average of 63% of the phosphorus applied during a 16-year period to a Hartsells fine sandy loam soil had been lost by erosion as compared to 40% for a corn, cotton and winter legume rotation. A study of 22 fields in Baldwin County that had been in potatoes from 5 to 30 years shows that the surface soil accumulated an average of 103 pounds $P_2O_5$ per acre per year in potatoes, although an estimated 200 pounds of $P_2O_5$ was added each year potatoes were grown.

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ETHYLENE GLYCOL RETENTION BY SOILS AS A MEASURE OF SURFACE AREA AND INTERLAYER SWELLING.

By C. A. Bower and F. B. Gschwend; Soil Sci. Soc. Amer. Proc., Vol. 16, No. 4, pp. 342-345. Oct. 1952

The ethylene glycol-retention method for determining interlayer swelling and the surface areas of clays has been modified for use on soils. Data are presented showing that values for external surface area obtained by the ethylene glycol-retention method agree satisfactorily with those obtained by the Brunauer-Emmett-Teller gas-adsorption method. The effects of various exchangeable cations, organic matter and soluble salts upon ethylene glycol retention were studied. The nature of the exchangeable cation had no significant influence upon values obtained for external retention by soils. Total retention by calcium- and hydrogen-saturated samples tended to be higher than that by sodium- and magnesium-saturated samples. The lowest values for total retention were obtained on potassium- and ammonium-saturated samples. The presence of organic matter increased values obtained for total retention.

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INFLUENCE OF CULTIVATION, MULCHING, AND FERTILIZERS ON CHEMICAL COMPOSITION OF PECAN LEAVES AND THEIR RELATION TO YIELD AND QUALITY OF NUTS.

By J. H. Hunter and H. E. Hammar; Soil Sci. Soc. Amer. Proc., Vol. 16, No. 4, pp.346-349.Oct.1952.

The objective of the study was to apply phosphate and potash fertilizers under two systems of culture with the view of increasing the uptake of these fertilizers. A block of trees was selected and the entire block was seeded to blue lupine for the purpose of supplying nitrogen to the trees.

The percentages of nitrogen, potassium. and calcium found in the leaves were not significantly influenced by either cultivation, mulching, or fertilizer. In 1950, the fourth year of treatment, the leaf phosphorus was increased significantly by the application of phosphate and by the summer mulching of the lupine. Leaf magnesium was not significantly influenced by the application of fertilizers but it was increased significantly by the summer mulching. The mean percentages of leaf N, P, and K were less in 1950 than in 1946, despite the fact that relatively large quantities of these elements were returned to the soil by the cover crop growth and the fertilizer applications.

Nuts of good quality were produced with a relatively wide range of total nutrients in the leaves. Yield of nuts and quality of the kernals were not highly correlated with the level of any one particular element found in the leaves, but there is evidence that the balance of elements in the leaves was the determining factor in influencing quality.

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THE NODULATION STATUS OF TRIFOLIUM AMBIGUUM.

By Don T. Parker and O. N. Allen; Soil Sci. Soc. Amer. Proc., Vol.16, No.4, pp.350-353. Oct.1952.

Trifolium ambiguum (Pellett clover) is a potentially important clover species, although nodule occurrence on its roots is rare, and evidence is lacking that it benefits from any association with rhizobia. The objective of this study was to ascertain the response patterns of this clover and 7 allied species to 35 diverse strains of Rhizobium trifolii. Alsike and Ladino were benefited by 31 strains. Twenty-two strains brought about ineffective respose to crimson and sub. Pellett was only sparsely nodulated and not benefited by any of the strains. The rhizobia isolated from Pellett brought about typical ranges of plant response of 7 other clover species tested. Probably explanations for the sparse nodulation and lack of effective response by Pellett to rhizobia are suggested.

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SELECTIVE EROSION OF SOIL FERTILITY CONSTITUENTS.

By H. F. Massey and M. L. Jackson; Soil Sci. Soc. Amer. Proc., Vol.16, No.4, pp. 353-356. Oct.1952.

Runoff samples from experimental plots were analyzed for total soil material, organic and ammonia nitrogen, available phosphorus, and exchangeable potassium. Correlation studies were carried out in an attempt to relate the selectiveness to the erosive process for a given fertility constituent to the quantity of eroded soil and concentration of suspended solids in the runoff. The selectiveness of the erosive process for the four fertility constituents determined increases in the order: organic matter, organic and ammonia nitrogen, available phosphorus, exchangeable potassium.

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HOST SPECIFICITY AMONG CERTAIN PLANTS IN THE COWPEA CROSS-INOCULATION GROUP.

By Joe C. Burton; Soil Sci. Soc. Amer. Proc., Vol. 16, No. 4, pp. 356-358. Oct. 1952.

The objectives of this study were (a) to determine the extent of host-plant specificity among various agriculturally important members of the cowpea cross-inoculation group and if possible (b) to select rhizobial strains adapted to a wide variety of hosts in this group.

In greenhouse tests 15 strains of rhizobia which were effective on their parent hosts were used as inocula for the cowpea, asparagus bean, peanut, indigo (4 species), crotalaria (3 species), velvet bean, partridge pea, jack bean and lima bean. Nodules were present on all inoculated plants. Only 7 of the 15 plant species tested gave effective response to 50% or more of the rhizobial strains used. None of the rhizobial strains were effective on all of the test plants.

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THE EFFECT OF PARTIAL PRESSURE OF OXYGEN ON SOME SOIL NITROGEN TRANSFORMATIONS.

By F. E. Broadbent and B. J. Stojanovic; Soil Sci. Soc. Amer. Proc., Vol.16, No. 4, pp. 359-363. Oct. 1952.

Two New York soils were incubated under conditions permitting control of the partial pressure of oxygen in a stream of gas passing continuously through the soil sample. Ammonium and nitrate salts and organic materials were added in various amounts and combinations and distribution of inorganic nitrogen determined at the end of each experiment.

Immobilization of added inorganic nitrogen occurred whether or not ample nitrogen was available to the soil population. Reduction of nitrate to ammonia was almost negligible at all oxygen

concentrations. Denitrification of added nitrate was inversely related to partial pressure of oxygen, but was of appreciable magnitude even under fully aerobic conditions. No evidence of nitrogen loss from the soil was obtained when ammonium salts were added. The experimental findings are compatible with the theory that nitrous oxide in the earth's atmosphere arises from the soil, and that denitrification is of major importance in the nitrogen cycle.

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CHEMICAL DETERMINATION OF SORBED WATER AND STRUCTURAL HYDROXYL IN COLLOIDAL MINERALS OF SOILS AND SEDIMENTS.

By E. J. Evans and M. L. Jackson; Soil Sci. Soc. Amer. Proc., Vol.16, No. 4, pp.364-368. Oct.1952.

A method is described for the differentiation of sorbed water from structural hydroxyl ions for colloidal minerals of soils and sediments. It is based on the extraction of the sorbed water with methanol. The structural hydroxyl is determined by heating the sample in a silica tube oven, passing a gas through the tube, and collection of the liberated water in methanol. The water contents of the methanol solutions are determined titrimetrically by utilization of the Karl Fischer reagent.

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A KEY FOR THE CLASSIFICATION OF FOREST HUMUS TYPES.

By M. D. Hoover and H. A. Lunt; Soil Sci. Soc. Amer. Proc., Vol. 16, No. 4,pp.368-370.Oct.1952.

A committee, consisting of representatives from all forest regions of the United States, was appointed to work out a forest humus classification which would be applicable to the entire country. The results of the efforts are given. The basic criteria in the classification are: (1) the presence or absence of an H layer; (2) the degree of incorporation of organic matter into the upper mineral soil layer, and (3) the structure, thickness and organic matter content of the H layer and/or the A horizon. These characteristics are recognizable in the field with a minimum of training. Further refinements should be avoided until shown to be significant.

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SOIL FERTILITY AND CORN PRODUCTION.

By G. E. Smith; Missouri Agr. Expt. Sta., Bul. 583. June 1952.

Results of recent experiments demonstrated that, through the adoption of proper soil management and fertilizer practices, yields of corn of 100 bushels or more per acre can be produced on soil once considered unsuited to this crop. It is now known that unprofitable yields of corn on many soils are due mainly to the failure of sufficient nutrients to be released to form the plant tissues required for growth and the formation of grain. Classifications of soils based on their capacity to produce corn is closely associated with the ability to supply the essential nutrients. In many cases, if the necessary elements are made available, the soils formerly considered unsuited to this crop can produce profitable yields.

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IRRIGATED AGRICULTURE.

By D. W. Robertson; Agron. Jour., Vol. 44, No. 12, pp. 597-602. Dec. 1952.

The author discusses the place of irrigation in our food production program. Some of the difficulties confronting irrigation agriculture are due to lack of sufficient knowledge of the water and the soil and the inter-relationships. He believes, however, that with the proper use of present knowledge, many of the unfavorable conditions can be eliminated and many more can be prevented.

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PLANT ANALYSIS--A METHOD OF DETERMINING THE PHOSPHORUS REQUIREMENTS OF PEAS.

By F. T. Tremblay and Karl E. Baur; Agron. Jour. Vol. 44, No. 12, pp. 614-618. Dec. 1952.

Chemical determination of the phosphorus in pea plants sampled periodically from experimental fertilizer plots showed that increased phosphate added in the fertilizers resulted in increased phosphorus uptake by the plants. Either the tops or leaves at the third node from the top of the plant are satisfactory positions to sample for determining the phosphorus status of the plants. The best time to sample the pea plants to determine their phosphorus status is between their four- to eight-node stage. Significant correlations were obtained between the yields of shelled or market peas and the phosphorus content of the tops and leaves.

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INFLUENCE OF PHOSPHORUS AND POTASSIUM FERTILIZATION OF TWO SOIL TYPES ON ALFALFA YIELD, STAND AND CONTENT OF THESE ELEMENTS.

By Russell K. Stivers and A. J. Ohlrogge; Agron. Jour., Vol. 44, No. 12, pp. 618-621. Dec. 1952.

Alfalfa was grown on Plainfield fine sand and Cincinnati silt loam fertilized with various amounts of phosphorus and potassium to determine the effect on yield, contents of phosphorus and potassium, and longevity of the stand. There was no positive yield response of alfalfa to phosphorus fertilization on Plainfield fine sand. However, phosphorus fertilization gave large yield increases on Cincinnati silt loam. Potassium fertilizer resulted in large yield responses.

EFFECT OF LIMING ON THE ABSORPTION OF CALCIUM, PHOSPHORUS AND NITROGEN BY SORGHUM PLANTS IN ALKALINE SOILS.

By A. Wahhub and Zahir Hussain Shah; Agron.Jour. Vol. 44, No. 12, pp. 621-625. Dec. 1952.

Liming increased the absorption of CaO, $P_2O_5$ and nitrogen by the sorghum plant.

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TRACE ELEMENTS IN AGRICULTURAL SLAGS.

By P. P. Chichilo and Colin W. Whittaker; Agron. Jour., Vol. 45, No. 1, pp. 1-5. Jan. 1953.

A survey was made of the total trace element contents of blast-furnace, basic, and phosphorus-furnace slags. It was concluded that soil limed at 4 to 5 year intervals with 4 tons of blast-furnace slag,or fertilized with basic slag, should be adequately supplied with manganese, even where that element was originally severely deficient. The manganese in phosphorus-furnace slag used for liming should supplement soil supplies under conditions of moderate deficiency. Boron needs would be partially to wholly supplied by blast-furnace slag for a season or two after application, while significant amounts of molybdenum may be supplied by basic slag. Amounts of copper and zinc in all these slags, while too small apparently to be important in correcting definite deficiencies, may assist in maintaining the nutrient status of the soil with respect to these elements.

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CROP AND VARIETY RESPONSE TO APPLIED PHOSPHATE AND UPTAKE OF PHOSPHORUS FROM SOIL AND FERTILIZER

By J. Mitchell, H. G. Dion, A. M. Kristjanson and W. T. Spinks; Agron. Jour.; Vol. 45, No. 1, pp. 6-11. Jan. 1953.

$P^{32}$ was used as a tracer in studying the uptake of soil and fertilizer phosphorus by varieties of wheat, oats, and barley. On less responsive soil, increased yields were obtained on the phosphated plots with a fairly high utilization of the fertilizer phosphate but with a rather marked decrease in utilization of soil phosphorus as compared with the uptake on the untreated plots. On a responsive soil a higher uptake of fertilizer phosphate occurred for all crops, and uptake of soil phosphorus in the case of oats and barley remained about the same on both fertilized and unfertilized plots, although there was a lower uptake of soil phosphorus on the fertilized wheat plots.

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DIFFERENTIAL RESPONSES OF OAT VARIETIES TO 2,4-DICHLOROPHENOXYACETIC ACID (2,4-D).

By Lyle A. Derscheid, L. M. Stahler and D. E. Kratchovil; Agron. Jour.; Vol. 45, No. 1, pp. 11-17. Jan. 1953.

The purpose of this study was to determine whether oat arieties gave a differential response to 2,4-D treatment and to determine whether yield reduction was transmitted to the progeny.

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THE NITROGEN COMPOSITION OF CEREAL GRASSES: III. AMINO-ACID DISTRIBUTION IN FIELD CLIPPINGS AND GROWING PLANTS.

By Elwood Reber and Robert MacVicar; Agron.Jour.; Vol. 45, No. 1, pp. 17-21. Jan. 1953.

Five common cereal grasses were clipped to simulate grazing throughout the spring growing season of two successive years. The leaf tissue was analyzed microbiologically for leucine, isoleucine, voline, threonine, methionine, lysine, glutamic acid, phenylalanine, and tryptophan. All varieties had a very similar pattern of distribution of these amino acids in the bulk proteins of the leaf clippings.

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FACTORS AFFECTING DRAINAGE DESIGN IN IRRIGATED AREAS.

By Roland C. Reeve; Agr. Eng.; Vol. 34, No. 2, pp. 88-90. Feb. 1953.

Drainage requirements, water-transmission properties of soils, and boundary conditions influence drainage design in irrigated areas. Drainage requirements include both the adequacy of drainage and quantity of water to be drained. The two factors which may be varied or altered in the design of drainage systems are (a) the quantityof water to be drained and (b) the boundary conditions. The amount of water to be drained is subject toacertain amount of control through improvements in irrigation and distribution and application efficiencies and other water-conservation measures. Drainage needs may be materially reduced by the use of preventive measures that eliminate or reduce sources of excess water.

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COMPACTION OF IRRIGATED SOILS BY TRACTORS.

By L.D. Doneen and D. W. Henderson; Agr. Eng., Vol. 34, No. 2, pp. 94-95, +102. Feb. 1953.

This paper is a report of a study conducted for the purpose of determining the effect of passage of a tractor over the soil at various intervals of time after irrigation.

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APPLICATION OF THE SOIL MOISTURE CHARACTERISTIC CURVE.

By G. J. Decker; Agr. Eng., Vol. 34, No. 2, pp. 96-97, +102. Feb. 1953.

The purpose of this study was to find the amount of water different soils will hold. The soil moisture characteristic curve was used. It will enable an irrigator to apply the water more efficiently. The percent of moisture retained in the soil at field capacity and at permanent wilting range can be found by use of the curve. From these two values the amount of moisture available to plants in the soil can be figured.

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SOIL CONDITIONERS IN SOIL CONSERVATION.

By C. S. Slater; Agr. Eng., Vol. 34, No. 2, pp. 98, 100, 102. Feb. 1953.

This paper discusses the use of soil conditioners in soil conservation.

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A PRESSURE-DISTRIBUTION PANEL FOR SOIL MOISTURE INVESTIGATIONS.

By W. McNab Miller; Agr. Eng., Vol. 34, No. 2, pp 104-106. Feb. 1953.

The author discusses the use of a pressure-distribution panel in soil moisture investigations.

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STAND DENSITY AND GROWTH.

By F. S. Baker; Forestry Jour., Vol. 51, No. 2, pp. 95-97. Feb. 1953.

Growth in a biological sense is not much affected by variation in common densities. In an economic or business sense growth is profoundly affected. The degree of effect is more a matter of products, markets, and prices than anything the biologist can ascertain in computations of gross increment.

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EFFECT OF HEAVY SELECTION LOGGING ON THE HERBACEOUS VEGETATION IN A PONDEROSA PINE FOREST IN NORTHERN ARIZONA.

By Joseph F. Arnold; Forestry Jour., Vol. 51, No. 2, pp. 101-105. Feb. 1953.

This paper shows how heavy selection logging effects the herbaceous vegetation of heavily timbered areas in northern Arizona. It reports the extent of the reduction of canopy, the overall response of the herbaceous vegetation, and the separate effects of canopy release, slash accumulation, and surface disturbances on the ground cover.

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A HALF CENTURY OF REFORESTATION IN THE TENNESSEE VALLEY.

By John C. Allen; Forestry Jour., Vol. 51, No. 2, pp. 106-113. Feb. 1953.

This paper discusses the reforestation program carried out in the Tennessee Valley which started in 1890 with the Biltmore Estate in North Carolina. Effect of erosion and parent soil material exerted a major influence on the growth of trees planted. Ground cover conditions affected significantly the growth of shortleaf pine and black locust.

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CONTROL OF MEDUSA-HEAD ON CALIFORNIA RANGES.

By Paul Furbush; Forestry Jour., Vol. 51, No. 2, pp. 118-121. Feb. 1953.

Medusa-head, a weedy annual grass, was controlled by controlled burning. Mowing and chemicals may also be helpful in controlling this pest. Its spread to new areas may be minimized by proper handling of livestock.

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DO AGE OF MOTHER TREES AND AGE OF CONES AFFECT DEVELOPMENT OF YOUNG JACK PINE?

By Paul O. Rudolf and R. A. Ralston; Forestry Jour., Vol. 51, No. 2, pp. 121-124. Feb. 1953.

Neither mother trees from 10 to 14 years old nor cones up to 5 years old affected the growth of young Jack pine adversely.

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USE OF IRRIGATION WATER ON THE HIGH PLAINS.

By C. A. Bonnen, W. C. McArthur, A. C. Magee, and W. F. Hughes; Texas Agr. Expt. Sta. Bul. 756. Dec. 1952.

The advantage of supplementing natural rainfall with irrigation is attested by the large and rapid increase in the number of wells and in the acreage of irrigated crops. Since 1934, the number of wells has increased from 300 to more than 16,000 and the acreage irrigated from 35,000 to more than 2 million.

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HAIRY VETCH, WILLAMETTE VETCH AND DIXIE WONDER PEAS AS SOIL -IMPROVING CROPS FOR CORN ON LUFKIN SOIL.

By E. B. Reynolds and F. A. Wolters; Texas Agr. Expt. Sta. Prog. Rept. 1531. Jan. 22, 1953.

There were no significant differences among the average yields of corn following hairy vetch, Willamette vetch and Dixie Wonder peas for soil improvement on Lufkin fine sandy loam for the 4 years, 1949-52. Applications of nitrogen, in

addition to the legumes, had no appreciable effect on the average yield of corn for the period. Good yields of corn were not obtained in any one of the four years, due mainly to a lack of moisture during the maturing period.

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INFLUENCE OF PRESS WHEELS ON STANDS OF COTTON.

By H. P. Smith and E. C. Brown; Texas Agr. Expt. Sta. Prog. Rept. 1533. Jan. 23, 1953.

This report gives the results obtained in 1952 of a study of the influence of press wheels on obtaining stands of cotton, which was begun in 1950.

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COTTON YIELDS IN EL PASO VALLEY AS INFLUENCED BY TIME OF APPLICATION OF AMMONIUM NITRATE AND SUPERPHOSPHATE, 1952.

By P. D. Christensen and P. J. Lyerly; Texas Agr. Expt. Sta. Prog. Rept. 1534. Jan. 26, 1953.

Cotton fertilizer tests in the El Paso Valley during the past several years have demonstrated a need for the regular application of nitrogen on most soils where cotton does not follow alfalfa, and a need for an occasional application of phosphate on some soils. These findings have been based on the application of fertilizer after the cotton was up during the approximate period of May 1 to June 10.

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COTTON YIELDS AT PECOS AS INFLUENCED BY TIME OF APPLICATION OF AMMONIUM NITRATE AND SUPERPHOSPHATE, 1952.

By P. D. Christensen, J. J. Bayles, and P. J. Lyerly; Texas Agr. Expt. Sta. Prog. Rept. 1535. Jan. 26, 1953.

Cotton fertilizer tests at Pecos during the past few years have shown a definite need for nitrogen, but little or no yield increases have resulted from phosphate applications. Since the fertilizers in these tests were applied after the cotton was up, the question arose as to the possibility of further increasing yields by applying fertilizer at planting or by making two applications of fertilizer at different times.

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COTTON YIELDS IN THE DELL CITY AREA AS INFLUENCED BY APPLICATIONS OF AMMONIUM NITRATE AND SUPERPHOSPHATE, 1952.

By P. D. Christensen and P. J. Lyerly; Texas Agr. Expt. Sta. Prog. Rept. 1536. Jan. 26, 1953.

In fertilizer tests at Dell City to determine whether nitrogen or phosphate fertilizers would increase cotton yields on soil in that area, yields were increased highest where ammonium nitrate was applied at the rate of 182 pounds per acre but the data on the phosphate is not consistent and more tests should be conducted.

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YIELD AND NITROGEN CONTENT OF LEGUMES AT COLLEGE STATION, 1937-52.

By E. B. Reynolds; Texas Agr. Expt. Sta. Prog. Rept. 1537. Jan. 26, 1953.

This is a summary of tests of several legumes grown for soil improvement for cotton and corn at the Main Station Farm during the past 16 years. Yields and nitrogen content of these legumes are assembled in this report for farmers and agricultural workers.

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CORN FERTILIZER-SPACING-VARIETY STUDIES NEAR COLLEGE STATION, 1949-51.

By F. L. Fisher and J. C. Smith; Texas Agr. Expt. Sta. Prog. Rept. 1538. Jan. 27, 1953.

This paper gives the results of a factorial experiment involving fertilizers, plant spacing and corn varieties conducted from 1949 through 1951 on a Norwood silty clay loam.

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CONTROL OF RHODESGRASS SCALE IN ST. AUGUSTINEGRASS LAWNS.

By Ben H. Richardson; Texas Agr. Expt. Sta. Prog. Rept. 1541. Feb. 4, 1953.

The only insecticide which gave significant results throughout the 3-year experiment on Rhodesgrass scale on St. Augustinegrass lawns was parathion. One percent parathion at the rate of 50 pounds per acre and one pound of 25 percent wettable powder in 200 gallons of water per acre gave good control. This insecticide is extremely poisonous.

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RICE IRRIGATION TESTS AT THE BEAUMONT STATION, 1952.

By Stanton R. Morrison; Texas Agr. Expt. Sta. Prog. Rept. 1542. Feb. 5, 1953.

A rice irrigation experiment was set up in 1952 at the Beaumont station whereby the application of water could be closely controlled. The objectives were to determine the effect of different watering practices on yield and quality of rice, and to determine which practices might effect a saving in the amount of water used in producing a rice crop. The work of the first year was exploratory. This report gives a summary in table form of the results.

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FESCUE GRASS AND LEGUMES FOR SOIL IMPROVEMENT AND FORAGE PRODUCTION AT THE BLACKLAND STATION.

By Ralph J. Hervey and Elton D. Cook; Texas Agr. Expt. Sta. Prog. Rept. 1543. Feb. 6, 1953.

Data on forage yields were collected at the Experiment Station at Temple during the past 4 years from two rotation experiments which included a cool-season perennial grass and several legumes. Yield data and steer gains also were determined on field-size areas. The grass, Kentucky 31 fescue, and the legumes, hairy vetch and Hubam and Madrid sweet-clover grown with the grass were turned under after 2 or 3 years growth

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CHEMICAL CONTROL OF JOHNSONGRASS AT THE BLACKLAND STATION, 1952.

By Elton D. Cook; Texas Agr. Expt. Sta. Prog. Rept. 1544. Feb. 7, 1953.

The effectiveness of certain chemicals in killing established Johnsongrass on non-cropped Houston clay at the Blackland Station in 1952 is discussed in this report. The chemicals used were ammate, Borascu, Polybor-chlorate and sodium TCA.

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SURFACE AREAS AND RELATIVE SOLUBILITY OF AGRICULTURAL LIMESTONE.

By R. H. Webster, C. E. Evans, G. W. Volk, and P. F. Pratt; Agron. Jour., Vol. 45, No. 2, pp. 39-42. Feb. 1953.

Measurements were made to determine the effect of particle-size variation on the reaction rates of calcitic and dolomitic limestones. The results indicated that particle sizes which are 30-40 mesh or finer have about equal effectiveness in bringing about pH changes in H-clay suspensions. Particle sizes of 8-20 mesh or larger are very slow in raising the pH of H-clay suspensions. Relative reaction rates of the complete limestone samples were measured by changes in pH of the H-clay suspensions and the results are specific for each individual sample.

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INFLUENCE OF ASSOCIATION UPON THE FORAGE YIELD OF LEGUME-GRASS MIXTURES.

By D. E. McCloud and G. O. Mott; Agron. Jour., Vol. 45, No. 2, pp. 61-65. Feb. 1953.

This is a report of a study to determine the behavior of legumes and grasses when grown in association beginning in the seedling year and continuing through succeeding years. The performance of different mixtures varied from mutually depressive, depressive, no interaction, to beneficial and mutually beneficial, indicating the multiplicity of factors involved.

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COMPARISON OF THE CAROTENE AND NITROGEN CONTENTS OF ALFALFA FORAGE FROM SELECTED CLONAL LINES.

By E. V. Staker and Bliss H. Crandall; Agron. Jour., Vol. 45, No. 2 pp. 66-68. Feb. 1953.

A comparison was made of the carotene and nitrogen contents of the forage from 11 selected alfalfa clonal lines as well as that from the variety of Grimm. Data were obtained for alfalfa cut at the prebud stage and that harvested at the early bloom stage.

No significant difference was indicated in carotene content of vegetative material from the clones, but differences in nitrogen content between clones were significant. A significant correlation was also found between the nitrogen and carotene contents for clone means and a highly significant correlation between random variation in carotene and nitrogen contents.

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GERMINATION AND EMERGENCE OF SEVERAL VARIETIES OF BARLEY IN SALINIZED SOIL CULTURES.

By A. D. Ayers; Agron. Jour., Vol. 45, No. 2, pp. 68-71. Feb. 1953.

As a part of a general investigation of the relative salt tolerance of barley, the germination and emergence of 30 varieties were studied under controlled conditions. It was found that there were significant differences of possible agronomic importance in the salt tolerance of the varieties tested.

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CHEMICAL HOEING COMES OF AGE.

By Roy L. Lovvorn and W. C. Shaw; What's New in Crops and Soils, Vol. 5, No. 6, pp. 9-12. Mar. 1953.

Chemical weed control is now an established part of good farming. Several million acres of various crops are being treated annually with 2,4-D to control weeds, with the acreage increasing rapidly.

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LOW COST FORAGE HARVESTER USES NEW CUTTING PRINCIPLE.

What's New in Crops & Soils, Vol. 5. No. 6, pp. 13 and 23. Mar. 1953.

This paper describes a "hammer-mill" mow being used for harvesting forage crops. This harvester eliminates the conventional sickle-bar and cutterhead. Based on the new cutting principle the machine combines the usual mower-bar and ensilage-chopper units into a single mechanism. It uses several dozen swinging knives mounted on a rotating transverse shaft, like an extra wide hammer-mill.

SAMPLES OF SOIL TESTS TELLS WHEN TO IRRIGATE.

By C. H. Diebold; What's New in Crops & Soils, Vol. 5, No. 6, pp. 14-15. Mar. 1953.

This article explains how samples may be used to determine when irrigation is necessary.

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LOW-COST LININGS FOR IRRIGATION CANALS.

By W. T. Moran and J. M. Shaw; What's New in Crops & Soils, Vol. 5, No. 6, pp. 16-17.Mar.1953.

This paper describes a lining of low cost which can be used to line irrigation canals.

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FROM BRUSH TO GRASS TO CATTLE.

By Victor P. Osterli and R. Merton Love; What's New in Crops & Soils; Vol. 5, No. 6, pp. 18-19. Mar. 1953.

The authors describe a method whereby brush lands in Californiaare being changed to profitable grazing lands. The method consists of clearing brush lands and converting them to the production of grass and legume forage. The land is first cleared of brush, seeded and then grazed so as to maintain stands and provide high forage yields.

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CHEMICALS REPLACE TILLAGE IN RENOVATING WORN-OUT PASTURES.

By M. A. Sprague; What's New in Crops & Soils, Vol. 5, No. 6, p. 23. Mar. 1953.

The use of sodium trichloroacetate has greatly simplified the job of preparing seed beds in renovating old, unproductive bluegrass pastures. In one test, only three diskings of the chemically treated, dead bluegrass sod produced almost as good a seed bed as 12 diskings of the untreated living sod. The yields of orchard grass Ladino forage the second season were almost identical from both seedings. In another trial, two diskings of treated sod turned as much soil as seven diskings of the live sod, and a smoother, less cloddy seedbed resulted.

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GRASS AND WEEDS--THE POTASH ROBBERS.

By R. E. Blaser and N. C. Brady; Better Crops with Plant Food, Vol. 37, No. 2, pp. 6-10, +47. Feb. 1953.

Soils often need to be supplemented with lime, phosphorus, potash, boron, sulfur, and other minerals to maintain a balance of grasses and legumes. When nitrogen fertilizers increase the yields, it is especially important to keep the level of fertilizer nutrients high. Grasses and legumes compete for potassium in the absence of nitrogen fertilizers. Where yields of sods are increased by applying nitrogen fertilizers, the level of other fertilizer minerals must be kept high enough in the soil to support an increase in herbage.yield and supply nutrients for all plants in the sod.

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SIXTEEN YEARS OF SOIL BUILDING ON VERMONT FARMS.

By Thomas H. Blow; Better Crops with Plant Food; Vol. 37, No. 2, pp. 11-14, +46-47. Feb. 1953.

This paper discusses the results of the soil building program conducted in Vermont over a period of 16 years.

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PALATABILITY OF PLANTS AS INFLUENCED BY SOIL TREATMENT AND VARIETY DIFFERENCES.

By M. J. Funchess; Better Crops with Plant Food; Vol. 37, No. 2, pp. 15-16, +44-46. Feb. 1953.

This article shows instances where livestock preferred forage or grain grown on specifically treated plots to forage or grain grown on plots treated differently.

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SERICEA IS A GOOD DROUGHT CROP.

By T. C. Mauer; Better Crops with Plant Food; Vol. 37, No. 2, pp. 21-22, +42-43. Feb. 1953.

Sericea lespedeza stood the drought better than most other forage crops during the past two droughty summers.

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LEGUME AND MANURE ROTATIONS IN THE WESTERN CORN BELT.

By T. A. Kiesselbach; Better Crops with Plant Food, Vol. 37, No. 2, pp. 23-26, +39-42. Feb. 1953.

The rotation of crops serves a multitude of purposes, and if properly planned, provides the basis for the soundest and most profitable agriculture in the western Corn Belt.

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IMPROVED MANAGEMENT OF IRRIGATED PASTURES PAYS DIVIDENDS.

By Arthur E. Miller and Carroll H. Dwyer; USDA, SCS, PA-205. Sept. 1952.

This paper reports the results of a 5-year study conducted on a 41-acre farm showing the value of improved and well-managed irrigation pastures.

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EFFECT OF LIMING AND FERTILIZATION ON YIELD AND THE CORRECTION OF NUTRITIONAL LEAF ROLL OF IRISH POTATOES.

By G. M. Volk and Nathan Gammon, Jr.; Fla. Agr. Expt. Sta. Bul. 504. Oct. 1952.

Nutritional leaf roll of Irish potatoes usually occurs on soils which are limited in their ability to carry on nitrification because of high acidity. It was shown that this difficulty could be corrected by the addition of lime in suitable amounts at the appropriate time.

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THE SOIL DEPLETING POWER OF THE FLAX CROP COMPARED WITH THAT OF HARD RED SPRING WHEAT, OATS AND BARLEY.

By C. O. Clagett, T. E. Stoa, H. J. Klosterman, A. F. Kingsley and W. W. Sisler; North Dak. Agr. Expt. Sta. Bul. 378. Aug. 1952.

This is a report on a study to determine the comparative soil depleting power of flax, wheat, oats and barley when grown under comparable conditions. It was found that the average flax crop removes smaller quantities of nitrogen, phosphorus, potassium, and sulfur than does an average crop of wheat, oats or barley. Such a flax crop removes approximately the same amounts of magnesium, and more calcium than do the other crops.

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A METHOD FOR EVALUATING SPRINKLER IRRIGATION SYSTEMS.

By Claude H. Pair and Dell G. Shockley; USDA, SCS, Research. July 1952.

This is a description of a method suggested for use in evaluating the performance of fixed head and perforated pipe types of sprinkler systems.

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A PRELIMINARY STUDY OF THE EFFECT OF SOME FUNGICIDES ON THE ESTABLISHMENT OF FORAGE SEEDLINGS.

By R. S. Fulkerson; Canad. Jour. of Agr. Sci., Vol. 33, No. 1, pp. 30-40. Jan.-Feb. 1953.

Several fungicides were used as seed treatments on eight grasses and five legumes commonly used in hays and pastures. The seeds so treated were grown in different soil types that gave wide differences in seedling establishment. Legume seedlings were found to be more severely attacked by damping-off organisms than grass seedlings. Leytosan P. gave good results when applied to most grasses and legumes, and excellent results when applied in excess amounts to red clover and alfalfa. Spraying the soil with the liquid fungicide Vancide 51 proved promising in establishing legumes.

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SOME RECORDS OF GRASSLAND FARMING IN WISCONSIN AND MINNESOTA.

By Orville E. Hays; USDA, SCS-TP-94. July 1950

This is a report of a survey made in Minnesota and Wisconsin during the winter of 1949-1950 to obtain information on grassland farming. Each farmer interviewed had practiced grassland farming for from 3 to 10 years. The results obtained are discussed.

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THE OCCURRENCE OF ANTIBACTERIAL SUBSTANCES IN SEED PLANTS WITH SPECIAL REFERENCE TO MYCOBACTERIUM TUBERCULOSIS.

By Ardeth Frisby, J. M. Roberts, J. C. Jennings, R. Y. Gottshall and E. H. Lucas; Mich. Agr. Expt. Sta. Quart. Bul., Vol. 35, No. 3, pp. 392-404. Feb. 1953.

This study was for the purpose of determining the occurrence of antibacterial substances in seed plants antagonistic to Mycobacterium tuberculosis.

Species belonging to 90 families were tested. Extracts of plants belonging to 59 families exhibited antibacterial activity. The total number of species studied is 259. One hundred and nine species contained principles controlling M. tuberculosis in vitro, 37 of which had specific activity. Antibacterial activity against Micrococcus pyogenes, var. aureus, Salmonella typhimurium and Escherichia coli was also recorded.

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PRODUCTION OF FOOD-FISH AND MINNOWS IN MICHIGAN PONDS.

By Robert C. Ball and John R. Ford; Mich. Agr. Expt. Sta. Quart. Bul., Vol. 35, No. 3, pp. 384-391. Feb. 1953.

Bullheads, in combination with minnows, make good growth and provide edible fish in ponds that may not be satisfactory for the production of bass and other game fish. In addition, the minnows can be harvested and sold as bait, thus providing a cash crop from land that might otherwise be considered as being unprofitable. Commercial production of minnows in combination with largemouth bass is not successful because of the effective predation of the bass, but the rearing of bass with golden shiner minnows will result in a high rate of growth for bass, and in ponds having higher aquatic plants enough minnows will escape to furnish a brood stock for the following year. In clear water ponds without vegetation, it may be necessary to add minnows.

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FOLIAR APPLICATIONS OF PLANT NUTRIENTS TO CROPS GROWN ON ORGANIC SOILS.

By Wade McCall and J. F. Davis; Mich. Agr. Expt. Sta. Quart. Bul., Vol. 35, No. 3, pp. 373-383. Feb. 1953.

This is a report of the results of foliar application of nitrogen, phosphorus, potassium, magnesium, manganese, boron, and zinc as sprays or dusts made in the greenhouse and in the field. The field experiments were conducted on onions, beets, potatoes and celery. In general, higher yields of crops were obtained from soil than from foliar applications of nitrogen. Phosphorus applied as a spray to onions and celery in 1951 and 1952 did not increase yields. In 1952, reductions in yields, closely approaching significance at the 5 percent level, were noted on those plots that were sprayed with supplemental phosphorus, whether applied in combination with or in the absence of a soil application of phosphorus. Zinc sprays, used either in the form of zinc sulfate of NU-Z at 2 pounds per 100 gallons of water caused a significant reduction in yield of onions and lower yields of potatoes in 1952. No significant difference in crop response to the manganese materials, NU-M or manganese sulfate, or to methods of applying them was found. The addition of 4 pounds of manganese sulfate, and one pound of borax per hundred gallons of spray increased the yields of potatoes approximately 100 bushels per acre in 1952.

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OCCURRENCE OF MAGNESIUM DEFICIENCY IN CELERY ON THE ORGANIC SOILS OF MICHIGAN.

By J. F. Davis and W. W. McCall; Mich. Agr. Expt. Sta. Quart. Bul., Vol. 35, No. 3, pp. 324-329. Feb. 1953.

The authors suggest that 10 pounds per acre of magnesium sulfate be applied as a spray at 10-day intervals throughout the growing season.

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ARE IRRIGATION WATERS INJURING UTAH SOILS?

By D. W. Thorne and J. B. Thorne; Utah Agr. Expt. Sta. Farm and Home Sci., Vol. 14, No. 1, pp. 3, +22. Mar. 1953.

Only a small proportion of Utah soils are being reduced in productive capacity through the effects of irrigation water. Some soils are being definitely improved through the leaching away of harmful salts and the replacment of alkali sodium on soil clay by calcium. The amount of salt in soil is closely related to the amount of irrigation water.

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WHY AGE CARP?

By W. J. McConnell; Utah Agr. Expt. Sta. Farm and Home Sci., Vol. 14, No. 1, pp. 6-7, +23. Mar. 1953.

With data on the age composition of a population of carp, it is possible for a fishing manager to predict the percent of a year's catch of carp that will reach a certain age and what size they will attain. It is also possible to decide whether a population of carp is being over- or under-exploited thereby placing carp production on a basis as sound as other types of animal production. By studying the size of carp gill covers a system was developed whereby the age of the fish could be determined. Carp attained lengths of 7, 14, 20, 25, 27, 28, and 28-1/2 inches for the first, second, third, fourth, fifth, sixth, and seventh years of life.

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BISCUITROOT SERICUSLY REDUCES YIELD OF WINTER WHEAT.

By D. C. Tingey; Utah Agr. Expt. Sta. Farm and Home Sci., Vol. 14, No. 1, pp. 12-13, +21-22. Mar. 1953.

Triethanolamine salt of 2,4-D applied at the rate of 2 pounds per acre prior to blooming was effective in controlling biscuitroot and increasing wheat yields.

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FERTILIZER EXPENDITURES IN RELATION TO FARM INCOME IN VARIOUS STATES.

By A. L. Mehring, Gae A. Bennett & J. R. Adams; Amer. Plant Food Jour., Vol. 6, No. 4, pp. 2-3, +8-10. Dec. 1952.

The average expenditure for fertilizer during the period 1910 to 1950 has averaged about 5.5 cents out of each dollar of farm income from crops and government payments. The lowest average was 3.8 cents in 1921 and the highest for any year prior to 1951 was 6.5 in 1944. In 1951 it was 6.8 cents.

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TRENDS AND CRITICAL STATUS OF FERTILIZERS.

By John R. Taylor, Jr.; Amer. Plant Food Jour., Vol. 6, No. 4, pp. 6-7, +11-13. Dec. 1952.

Major developments are taking place in the development and use of fertilizers which affect not only fertilizer manufacturers and farmers but the public at large. The proper use of the right kinds and amounts of fertilizer means in simple terms--an abundant supply of food and fiber at lower cost of production. Chemical fertilizer is the key that will unlock the door to continued agricultural abundance, to lower production costs and a higher standard of living. Adequate and efficient use of fertilizers--not production--is the problem which remains to be solved.

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